entbus
web-based energy monitoring

September 2013

entbus pro web-based energy monitoring software

entbus pro is an **Energy Monitoring** software, which is used for analyzing the **power factor correction** and **energy quality**.

It allows the users to monitor all of the energy measuring devices of an establishment via internet.

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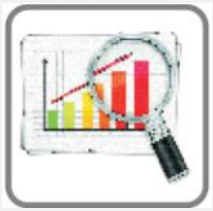
Power Factor Correction Tracking

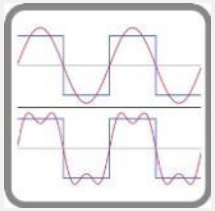
Alarm Notification by **SMS** and **e-mail**

Instantaneous Monitoring



Reporting

Meter Reading



Energy Quality

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Application areas

Malls and chain stores

Commercial, public buildings, Universities and Hospitals

Industrial Establishments

Electricity distribution and transmission companies, Industrial parks

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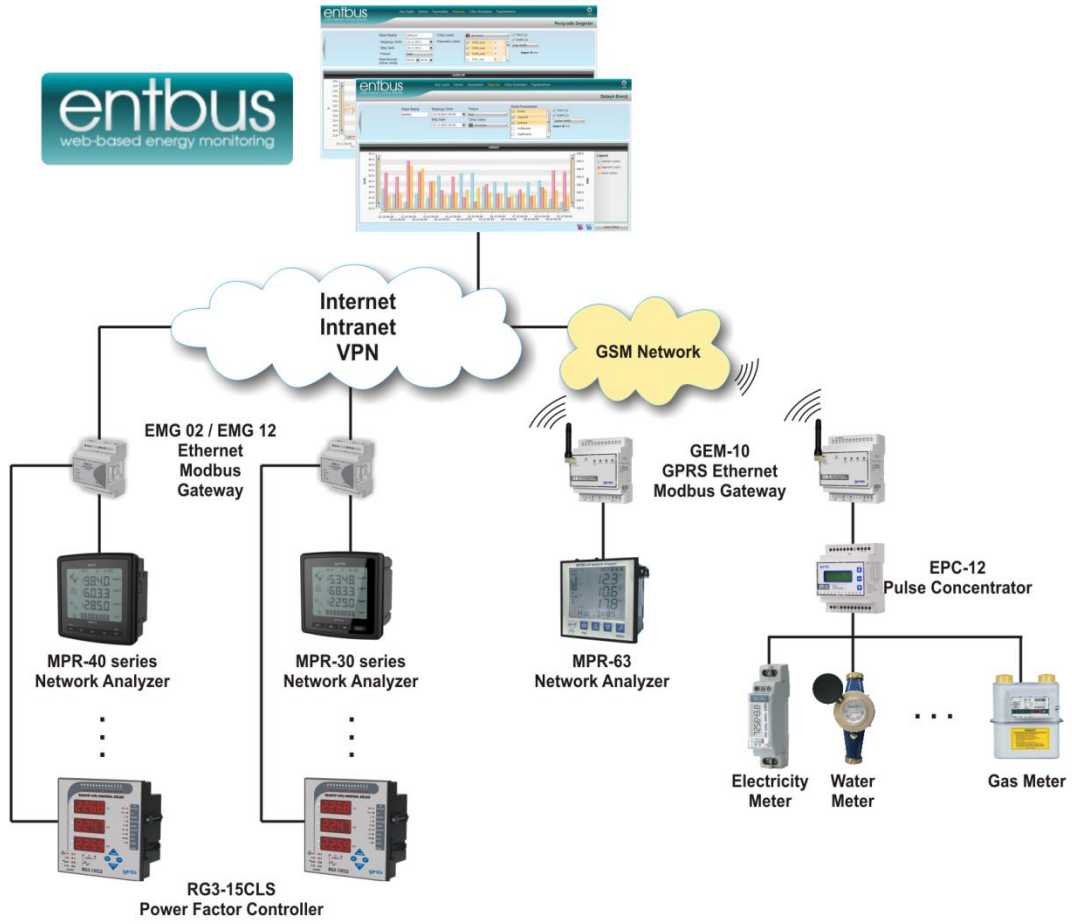
Energy monitoring needs of establishments

- Using the energy efficiently and in high quality
- Power factor correction tracking
- Sending alarms via SMS and e-mail for control and maintanence operations
- Monitoring the field instantaneously, creating analyses more easily with visual reports
- Determining how much energy has been used at what point between which times
- Accessing the data over the Internet, thus disabling the need to visit the site personally
- Calculating the capacity of existing system for new investments
- Creating different authorizations for more than one user for energy monitoring
- Selecting the appropriate time range for energy consumption at electricity meters with 3 tariffs

System Architecture



User-specific System Architecture

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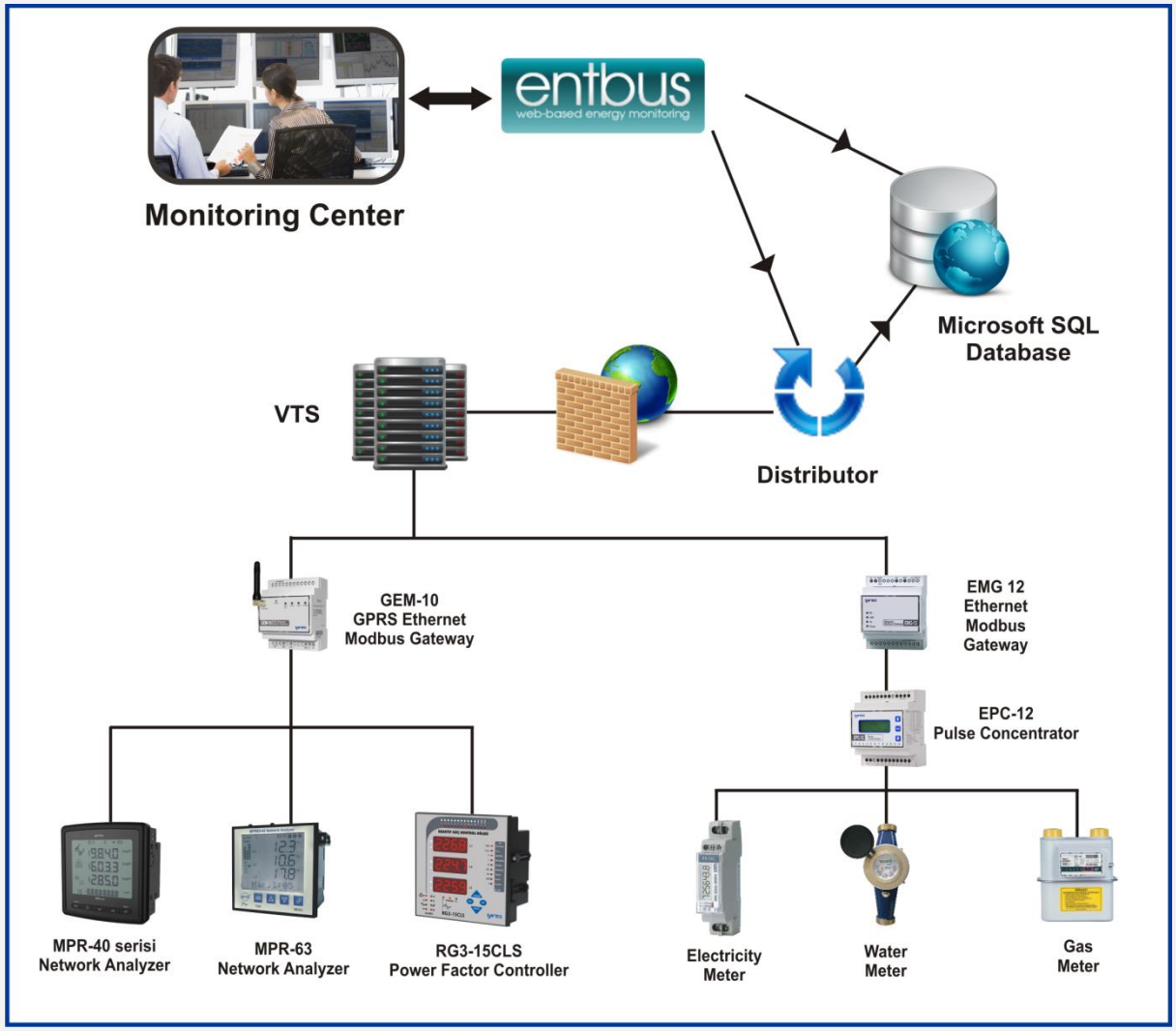
Energy management software

- Receiving alarms via e-mail and SMS
- Creating reports from the stored data, representing them graphically and exporting them to excel
- Defining virtual device and parameter
- Reading the values of meters with pulse output and making reports of their consumption
- Real-time data collecting and instantaneous monitoring
- Access via Internet/Intranet
- Defining modbus compatible devices of different makes and models
- Reports in form (bill) type
- Detailed filtering features for reports
- Remote configuration of measuring devices
- Multilanguage support

Operation of entbus pro system



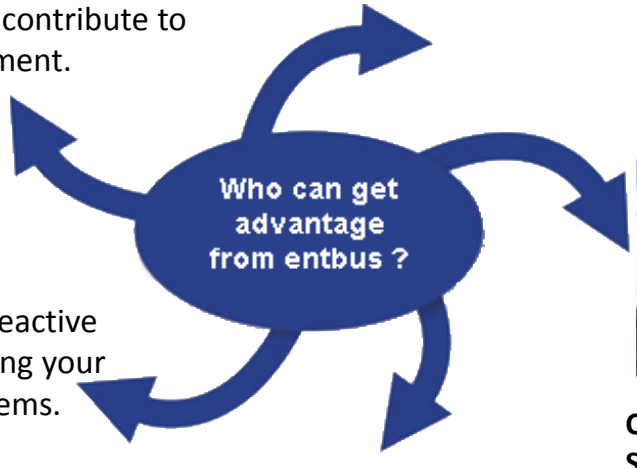
entbus pro system records the data, which it collected from the field, to the database. This way, retroactive records can be accessed.

Solutions for workgroups

Consultants and Engineers
By analyzing the energy consumption reduction possibilities of your employers, you can create projects for improvement. Thus, you can make informed decisions to reduce the carbon footprint of your customers while keeping their costs in an acceptable margin and contribute to protecting the environment.

Electricity distribution and Wholesale
By using entbus software, sub-metering can be performed in a cost-effective way. Furthermore; accessing gathered data, visual graphics and analysis can be developed through powerful interface of entbus, thus saving the maximum amount of energy.

Banks, Chain Stores
Energy efficiency can be increased by monitoring the energy consumption 24/7 at headquarters and branches. Additionally, you can avoid reactive power penalties by monitoring your power factor correction systems.



Commercial Buildings, Public buildings, Schools, Hotels, Hospitals
By monitoring the energy of integrated systems, energy consumption can be tracked closely. Tracking all of the possible parameters of your energy system allows you to increase your energy savings.

Factories, Production Facilities
By monitoring many energy parameters and energy consumption in factories, with entbus software, you can easily control the energy consumption and save precious electrical energy.

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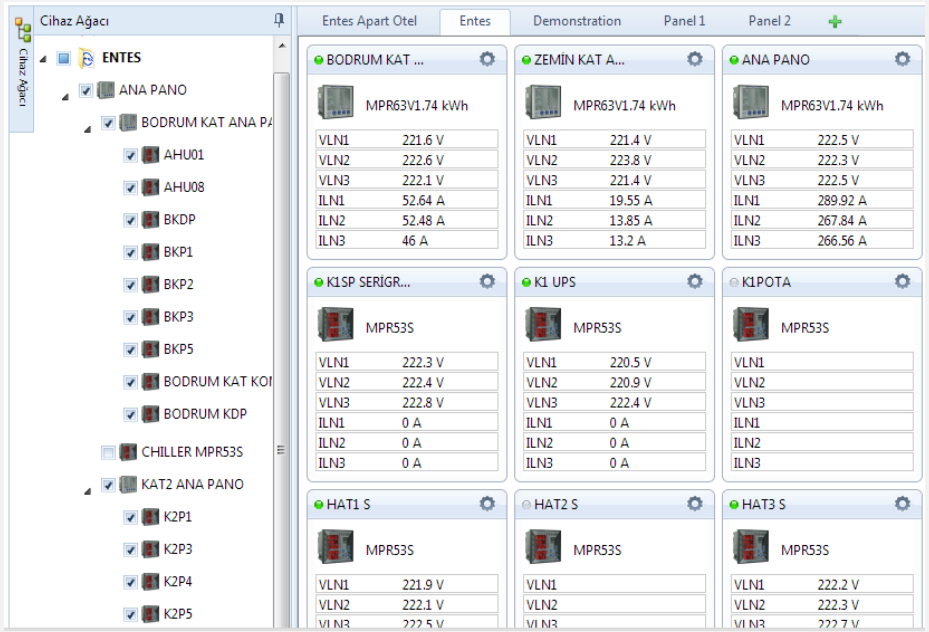
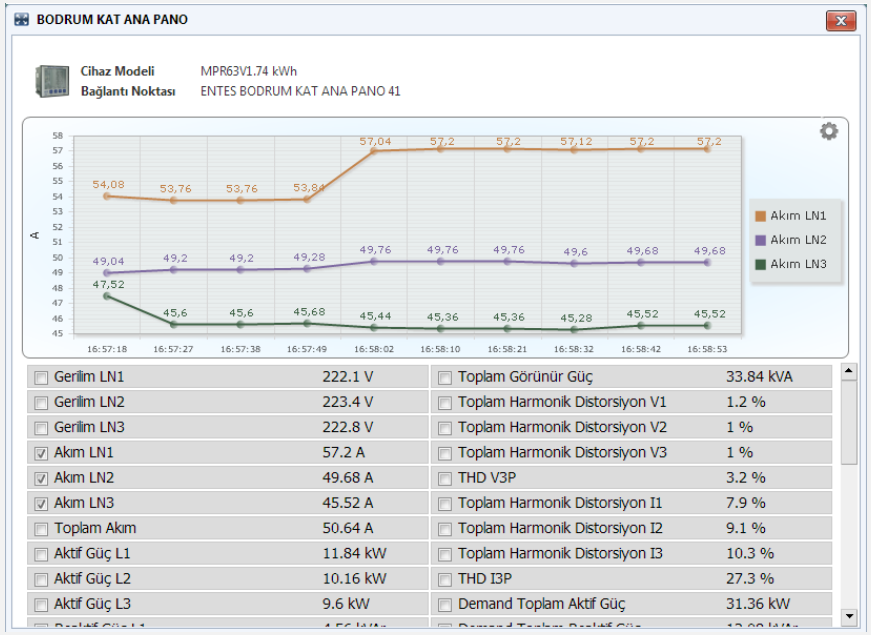
Instantaneous Monitoring





- Easy access to devices with hierarchical structure
- Easy monitoring by creating separate panels
- Monitoring of desired parameters by giving them priority

- Graphical representation for trend analysis
- Visual comparison of desired parameters

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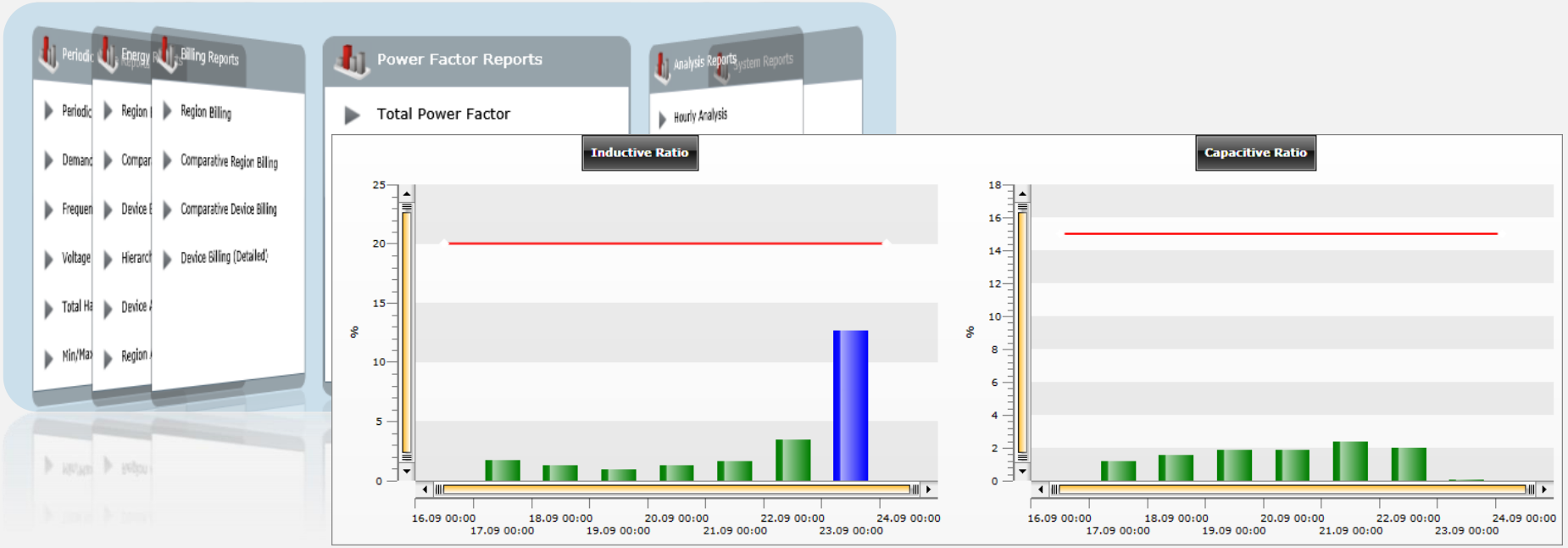
Report management



- The system offers the hard to understand value reports in an easily understandable visual way with its advanced reporting feature.
- It simplifies analyses with specially created reports.
- There are 27 specialized reports (Power Factor, Energy, Billing, Consumption, Demand, Harmonics, System)
  - ✓ ***All created reports can be exported as a table to Excel in "XLS", "CSV" "XML" formats.***

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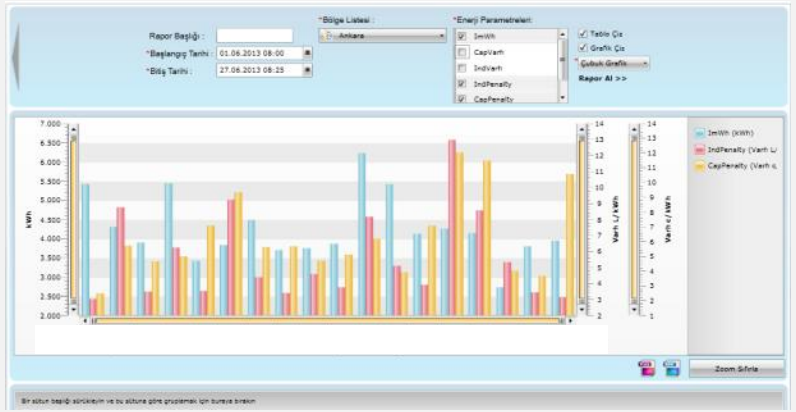
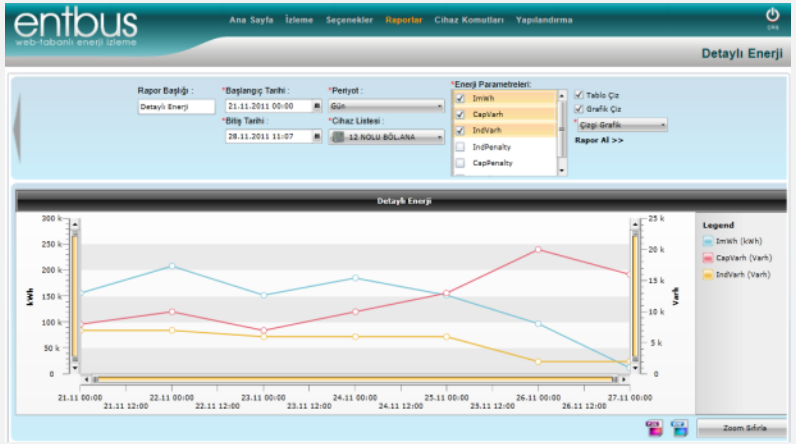
Report examples

Voltage comparison report



Energy comparison report

Region energy report



Detailed energy report

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Application example: University

Problem:

- Automatic power factor correction systems were needed because the law that went into effect recently stated that the **inductive reactive power ratio limit** is going to be **20%**.
- Public establishments were informed by the Energy Ministry about the **Energy Efficiency** project. The target efficiency numbers were **10%** for **2014** and **20%** for **2023**. That's the reason why **consumption monitoring** and **detailed data recording** became very important. The need to create projects by reviewing collected data and determining the most possible places for saving energy.
- The need to **monitor** and **analyze the scattered campuses in Istanbul, Ankara** and **Eskişehir** from a **single center.**
- To be able to calculate **the electrical infrastructure need** in the future expansion plan.

Entes products that have been used for the solution:

Bill of materials	Pieces
RG3-12CS Power Factor Control Relay	20
RG3-15CLS Power Factor Control Relay	3
EMG-12 Ethernet Modbus Gateway	15
GEM-10 GPRS Ethernet Modbus Gateway	5
Entbus Pro Energy Monitoring Software License	For 500 devices
MPR-63 Network Analyzer	87

Application example: University

Solution:

- Sensitive measurements of **frequency, voltages and demand values** have been done with **MPR-63** Network Analyzers and they have been recorded for **analysis. Maintenance and repair operations** of the system have been organized **by creating alarms.**
- **Harmonics that must be eliminated** have been identified with power factor correction system.
- **entbus pro** system has been used both **as a basis for analyses** and **for publishing the results of operations with reports** in **«Energy Efficiency»** project of Energy Ministry.
- The needed transformer load has been calculated for the new infrastructuring by measuring the load in time periods such day, night, work days and weekend days.
- **Monthly consumption values of buildings have been recorded** in efficiency operations done by the university.

Benefits:

- Thanks to the **20% energy saving goal** mandated in their **«Energy Efficiency»** project; Anatolian University, which is currently paying **750.000 TL** every month, is going to pay **150.000 TL** less each month.
- By using **quality energy, experiment machines** throughout the university have been **protected from braking down** and **maintenance/repair operations** have been organized.

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Application example: Chain Store

Problem: Exceeding the reactive penalty limit at a chain store with 58 branches
Diagnosis: Unequal distribution of loads on phases, wrong current transformer selection, Wrong capacitor selection, error in selecting the Power Factor Control Relay

Entes products used for the solution:

Bill of materials	Pieces
RG3-12CS Power Factor Control Relay	58
EMG-12 Ethernet Modbus Gateway	12
Entbus Pro Energy Monitoring Software License	For 500 devices

- 10% was being added to the bills of shopping mall at **Bodrum/Muğla** for transformer loss. With the use of RG3-12CS, reactive penalties were avoided. 20.000 TL was saved monthly at this shopping mall.
- It has been uncovered that the shopping mall management in **Izmir** was adding 5% to the electricity bill even though there wasn't such a clause in the contract.
- Shopping mall management issued a retroactive return invoice to the store which amounted to 14.000 TL.
- It has been uncovered that the shopping mall management in **Istanbul** was doubling the electricity bill amount of the store. Shopping mall management admitted their mistake and paid the store 56.000 TL + Taxes.

Result: Thanks to all these measures taken, all 58 stores of the chain have avoided the reactive energy penalties and the store management saved 13% on their monthly energy consumption costs. Devices that have been integrated to the system have returned their investment in only one month.

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