



SMART GRID MANAGEMENT SYSTEM



WHY SMART GRID MANAGEMENT ?

ALLOWS EFFICIENT AND INTEGRATED MANAGEMENT
OF THE ELECTRICAL DISTRIBUTION NETWORK.



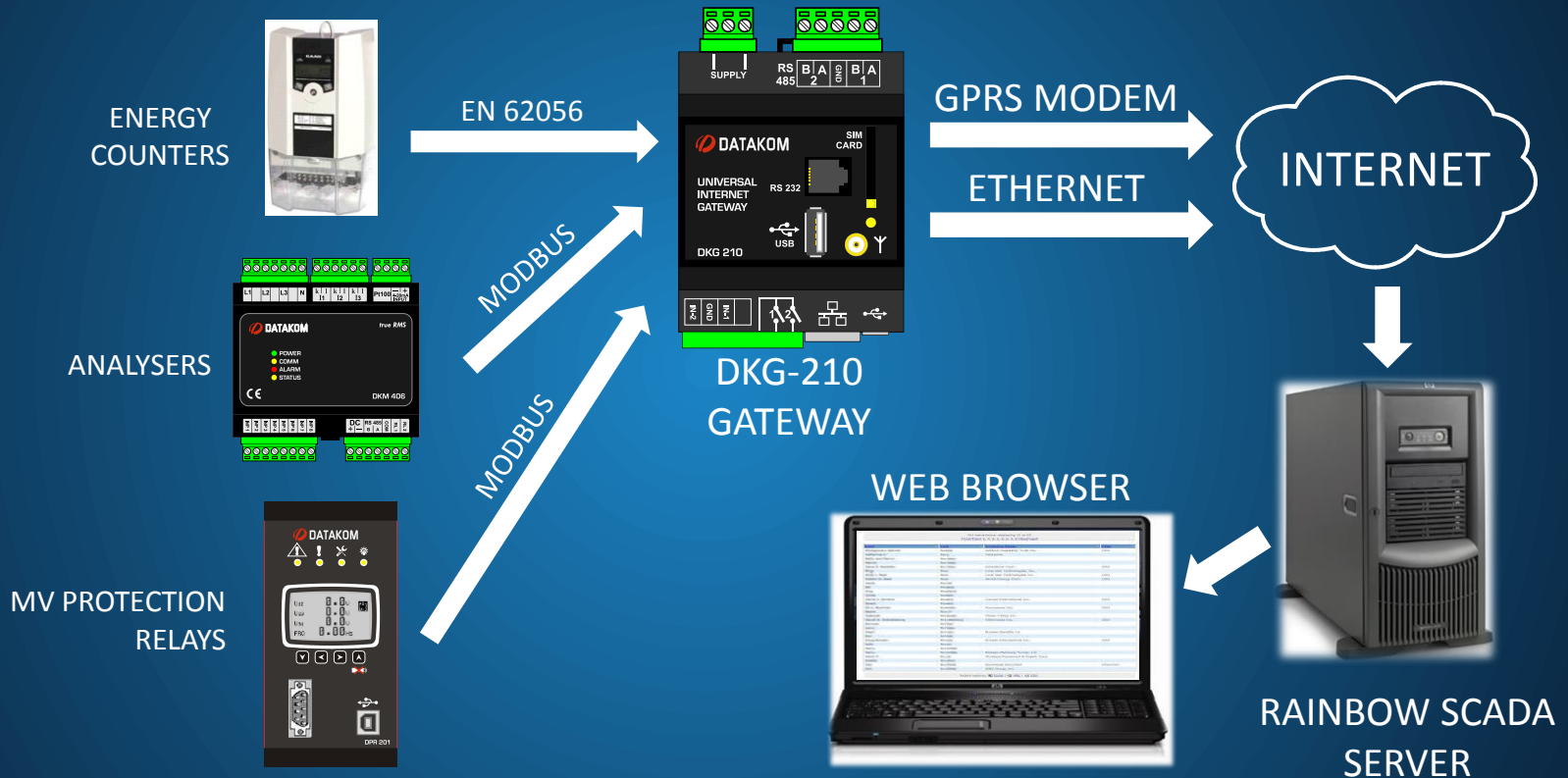
TARGETS

A MONITORING AND CONTROL SYSTEM WITH

- HIGH PERFORMANCE
- FLEXIBILITY
- EASY SET-UP
- LOW INVESTMENT COST
- READY FOR UNLIMITED EXPANSION
- CAPABLE OF ADAPTING TO ADDITIONAL REQUIREMENTS



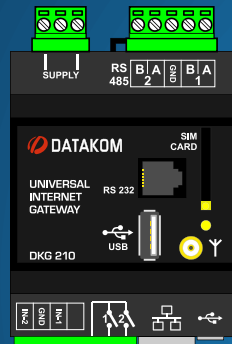
HOW THE SYSTEM WORKS ?



- THE GATEWAY MODULE COLLECTS INFORMATION
- SENDS TO THE CENTRAL SERVER THROUGH INTERNET
- MONITORING AND CONTROL IS PERFORMED THROUGH INTERNET



EASY SET-UP



DKG-210
GATEWAY

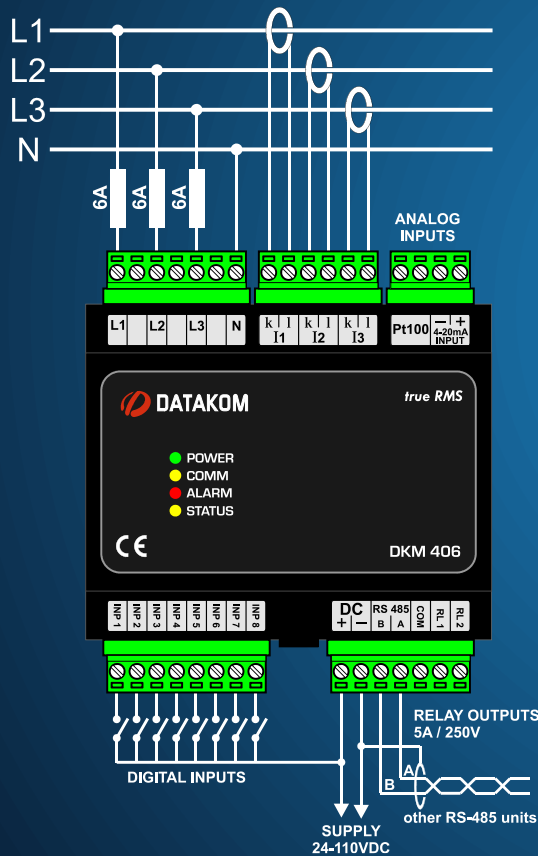


RAINBOW SCADA
SERVER

- **REAL IP NOT REQUIRED**
- **STATIC IP NOT REQUIRED**
- **DATA SERVER NOT REQUIRED**
- **WORKS WITH ANY DATA SIM CARD**



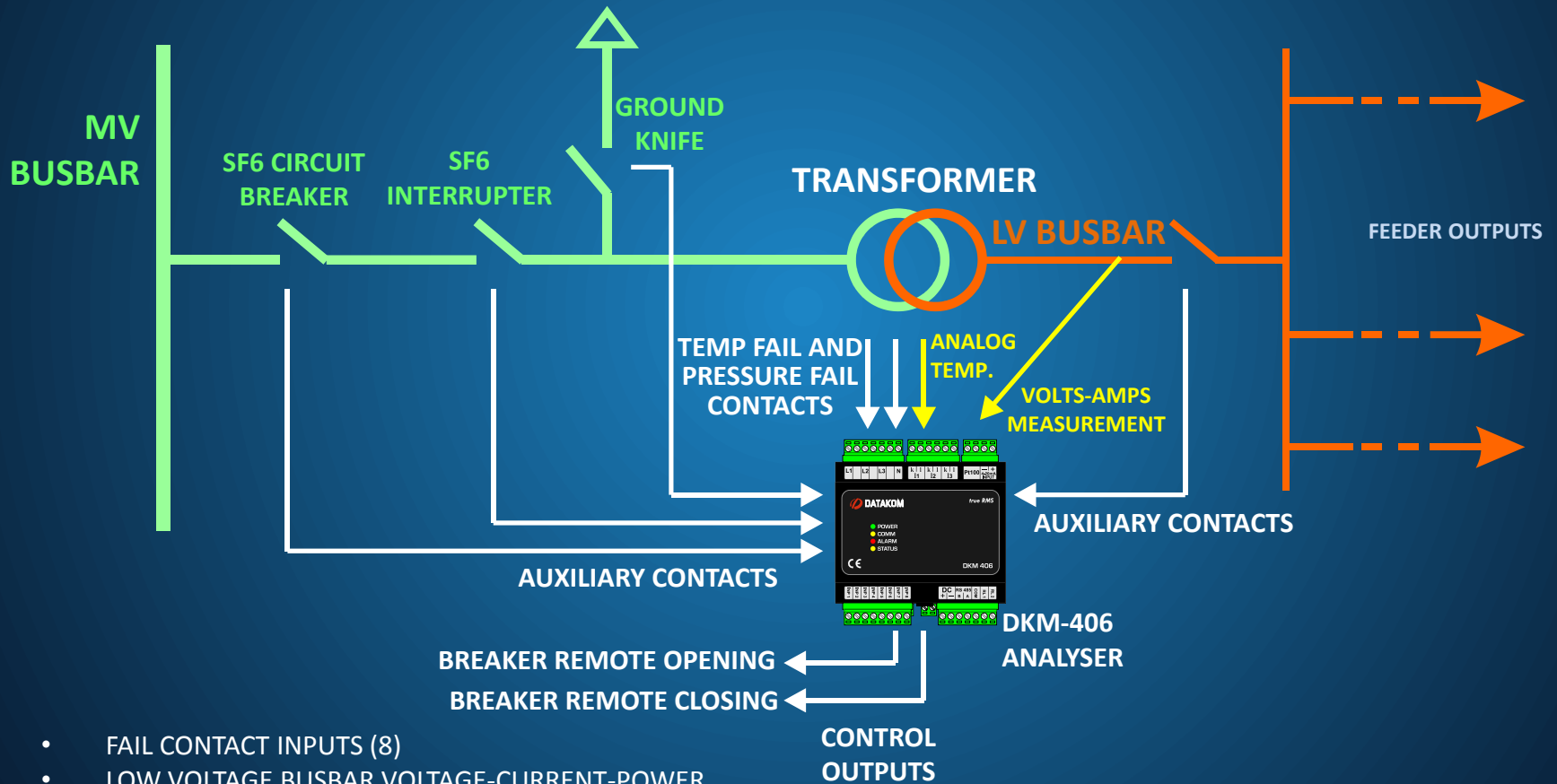
DATA COLLECTOR UNIT



- INTEGRATED POWER ANALYSER
- ISOLATED CURRENT TRANSFORMER INPUTS
- CONNECTS SERIALLY TO EXISTING CTs
- 8 x AUXILIARY CONTACT INPUTS
- 1 x PT100 TRANSFORMER TEMPERATURE INPUT
- 1 x 4-20mA ANALOG INPUT
- 2 x 5A/250V RELAY OUTPUT
- ISOLATED RS-485 MODBUS PORT



TRANSFORMER CENTER MONITORING EXAMPLE



- FAIL CONTACT INPUTS (8)
- LOW VOLTAGE BUSBAR VOLTAGE-CURRENT-POWER
- TRANSFORMER TEMPERATURE
- DC SUPPLY VOLTAGE (24/110V)
- CONTROL OUTPUTS (2)



AVAILABLE INFORMATION FROM TRANSFO CENTER

- INTERRUPTER OPEN/CLOSE STATUS (8)
- LV BUSBAR VOLTAGE-CURRENT-POWER
- TRANSFORMER TEMPERATURE
- DC SUPPLY VOLTAGE (24/110V)
- FAIL CONTACT INFORMATION TRANSMITTED WITHOUT ANY DELAY



RAINBOW SCADA PROGRAM

60.000 DEVICES MONITORED SIMULTANEOUSLY





CONTROL CENTER FEATURES

MONITORS ALL DEVICES ONLINE & REAL TIME



VOLTAGE-CURRENT-POWER-ALARM INFORMATION OF AREAS
AND TRANSFORMER CENTERS



CONTROL CENTER FEATURES

ONLINE ALARM LIST

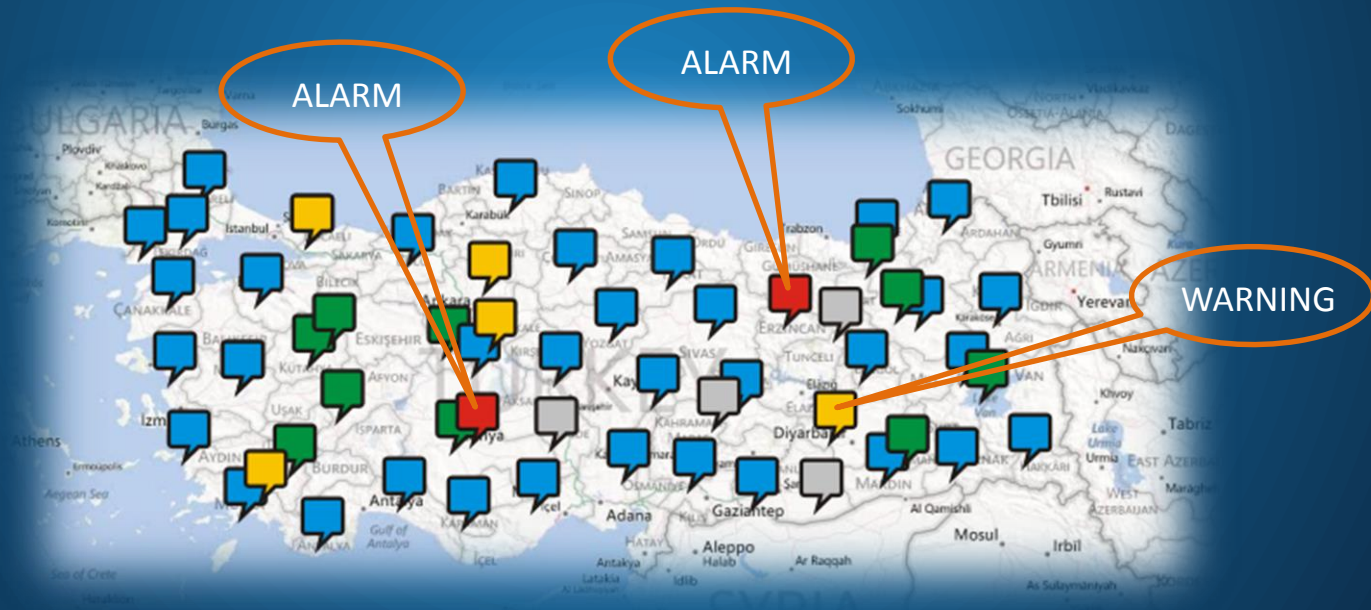


LAST ALARM APPEARS AT THE TOP OF THE LIST



CONTROL CENTER FEATURES

ALTERNATIVE MONITORING:
REAL TIME & ONLINE ON MAP

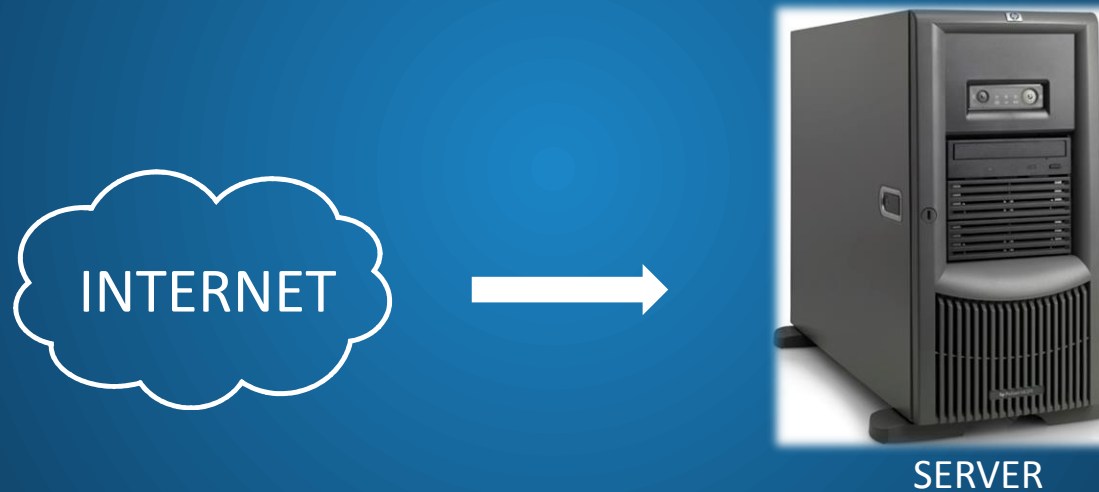


STATUS OF DEVICES REPRESENTED WITH COLORS



CONTROL CENTER FEATURES

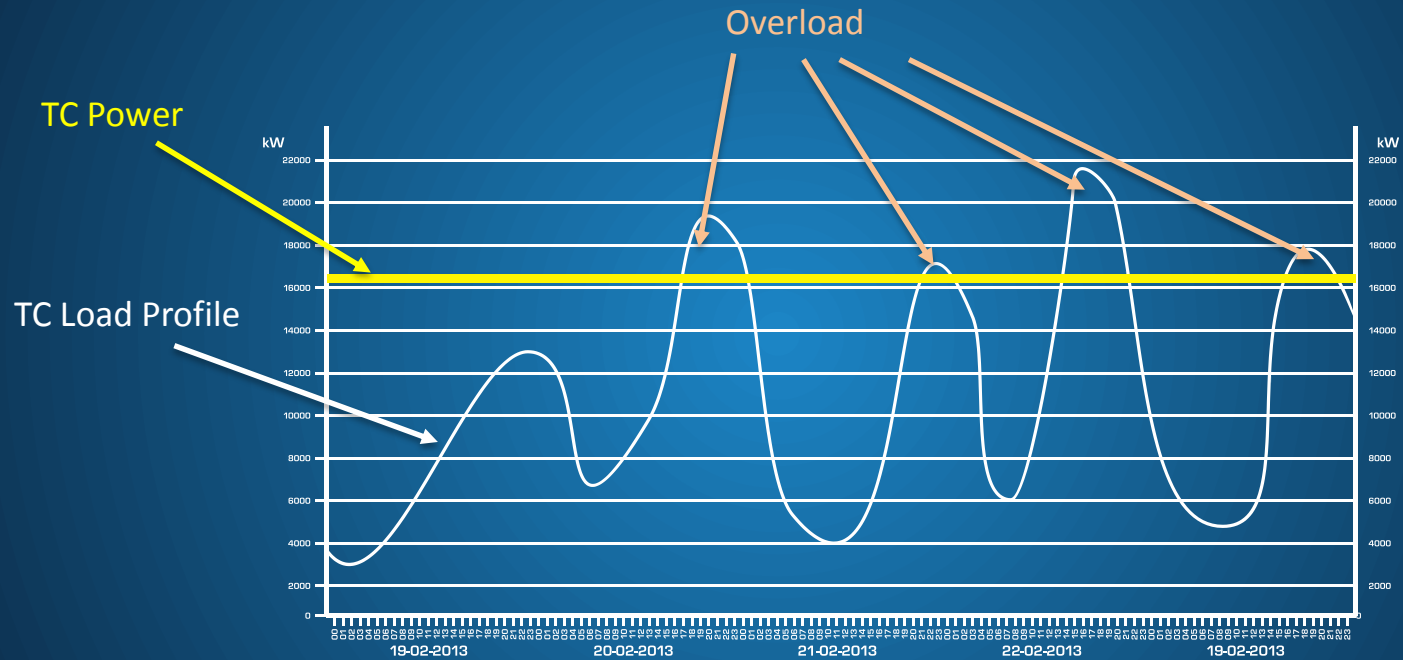
ALL INCOMING INFORMATION RECORDED



DATA BACKUP UNIT KEEPS ALL INFORMATION ABOUT LAST 5 YEARS



CONTROL CENTER FEATURES

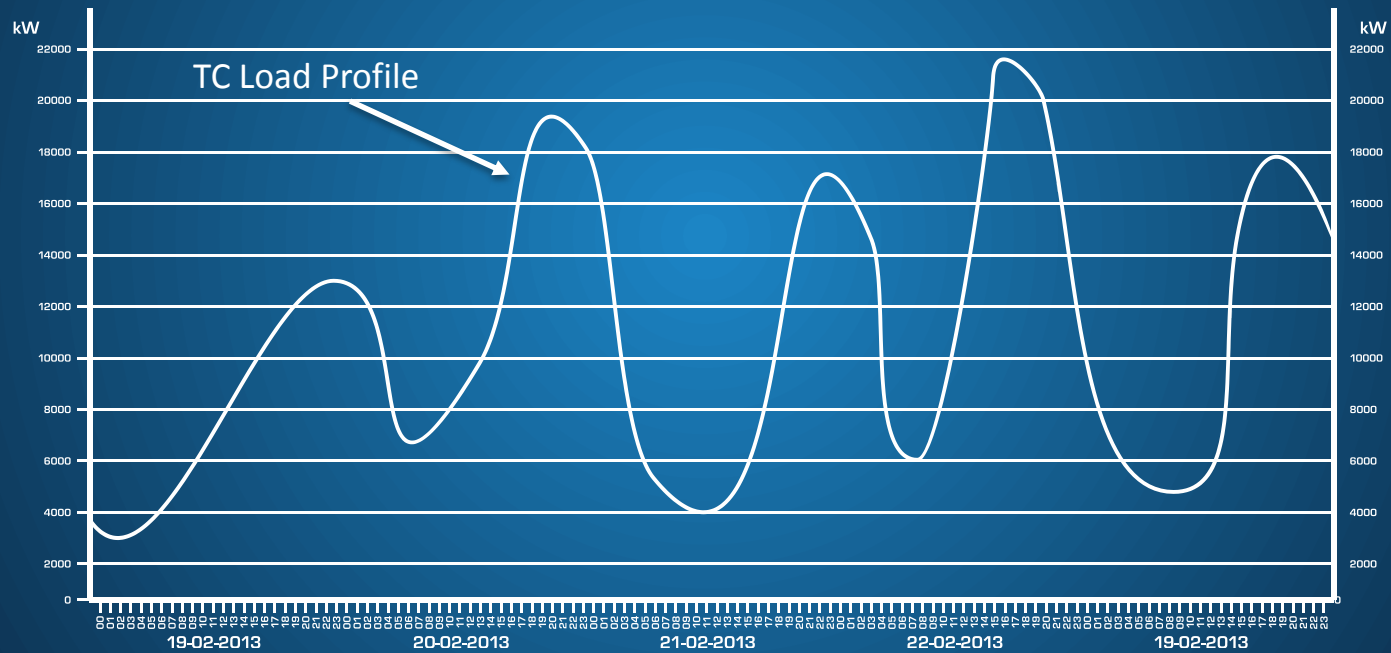


- HELPS GRID DIMENSIONING
- DETERMINES OVERLOADED TRANSFORMERS
- DETERMINES UNDER-LOADED TRANSFORMERS



CONTROL CENTER FEATURES

TIME BASED ANALYSIS OF THE SELECTED CENTER

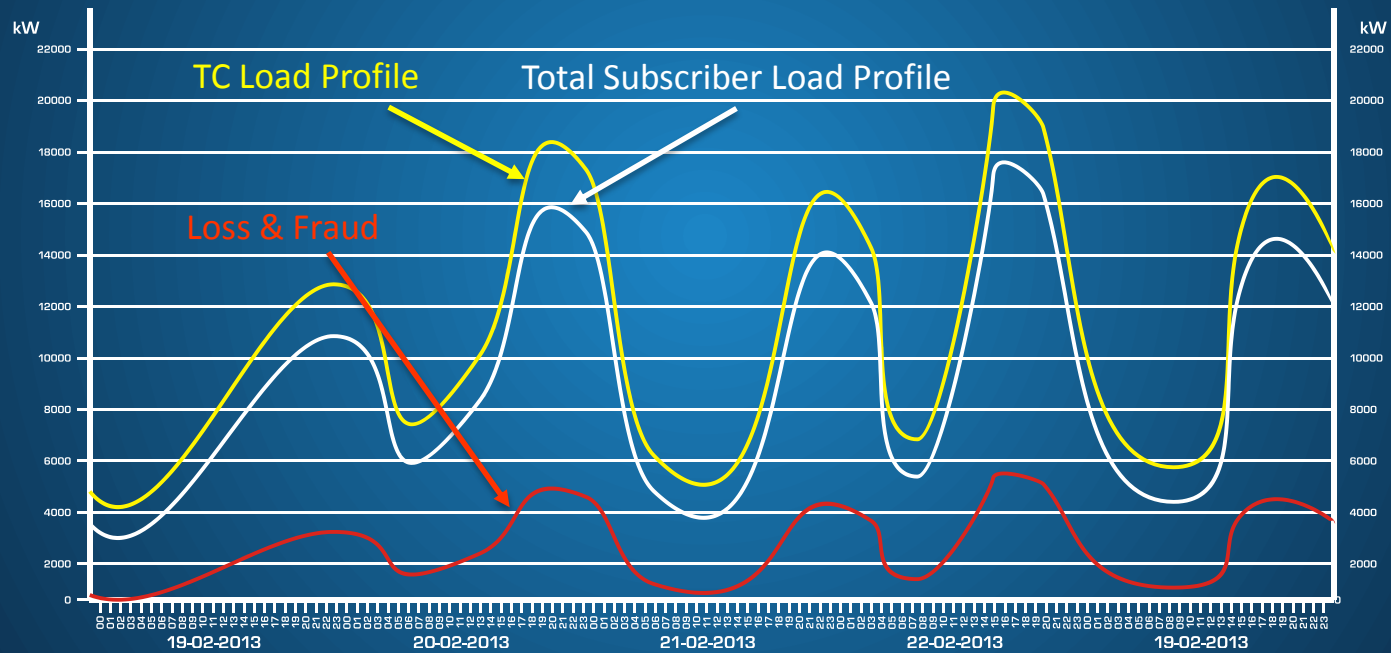


ALLOWS EXACT ESTIMATION OF THE ENERGY DEMAND



CONTROL CENTER FEATURES

SIMULTANEOUS ANALYSIS



HELPS DETERMINING LOSSES AND FRAUDS



CONTROL CENTER FEATURES

HTML FEATURE

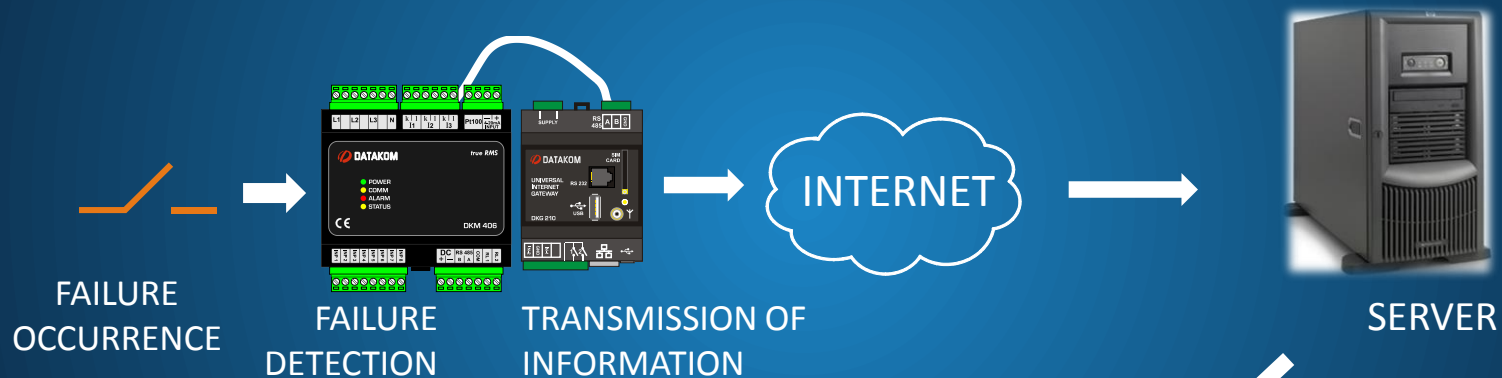


- AUTHORIZED PERSONNEL CAN MONITOR THE GRID THROUGH WEB
- PARTIAL MONITORING SUPPORTED



ADVANTAGES OF SMART GRID MANAGEMENT

PROVIDES IMMEDIATE FAILURE INFORMATION

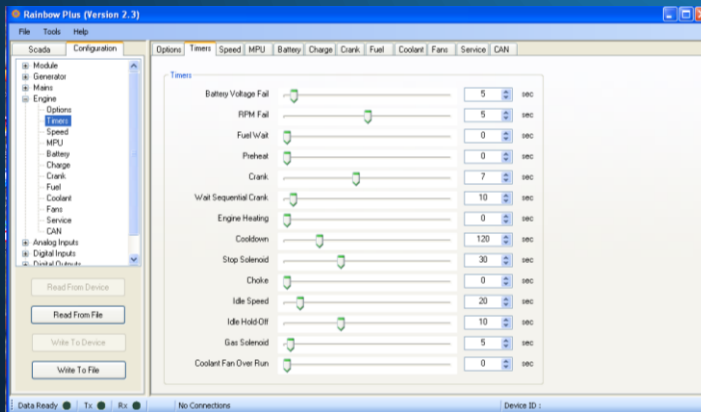


- POWER CUTS
- OVERLOADS
- EXCESS HARMONICS
- VOLTAGE UNBALANCES
- CURRENT UNBALANCES
- INTRUSION DETECTION TO THE TC



ADVANTAGES OF SMART GRID MANAGEMENT

PERFORM PARAMETER EDITING FROM THE CONTROL CENTER



RAINBOW PLUS PROGRAM



ADVANTAGES OF SMART GRID MANAGEMENT

PREVENT FAILURES BEFORE THEY HAPPEN

- OVERLOAD
- CURRENT UNBALANCE
- VOLTAGE UNBALANCE
- EXCESSIVE HARMONICS



ADVANTAGES OF SMART GRID MANAGEMENT

LESS MANPOWER FOR SERVICE AND MAINTENANCE



NO!



YES !

ELIMINATE UNNECESSARY MAINTENANCE VISITS



ADVANTAGES OF SMART GRID MANAGEMENT

- ON-LINE & REAL TIME MONITORING
- LOW SYSTEM INSTALLATION COST
- EASILY EXPANDABLE
- INTERNET BASED OPERATION
- SUPPORTS BOTH GPRS AND ETHERNET CONNECTIONS
- SUPPORTS MULTI-POINT MONITORING
- INCREASES EFFICIENCY OF THE GRID
- IMMEDIATE FAULT MONITORING, NO DELAY
- PROVIDES STATISTICS ABOUT POWER CONSUMPTION
- HELPS DIMENSIONING OF THE GRID
- HELPS DEMAND ESTIMATION
- HELPS DETERMINATION OF LOSSES AND FRAUDS
- DETAILED REPORTING FEATURES
- REMOTE PARAMETER EDITING
- PROVIDES WARNINGS BEFORE ALARMS
- HELPS SAVING MANPOWER