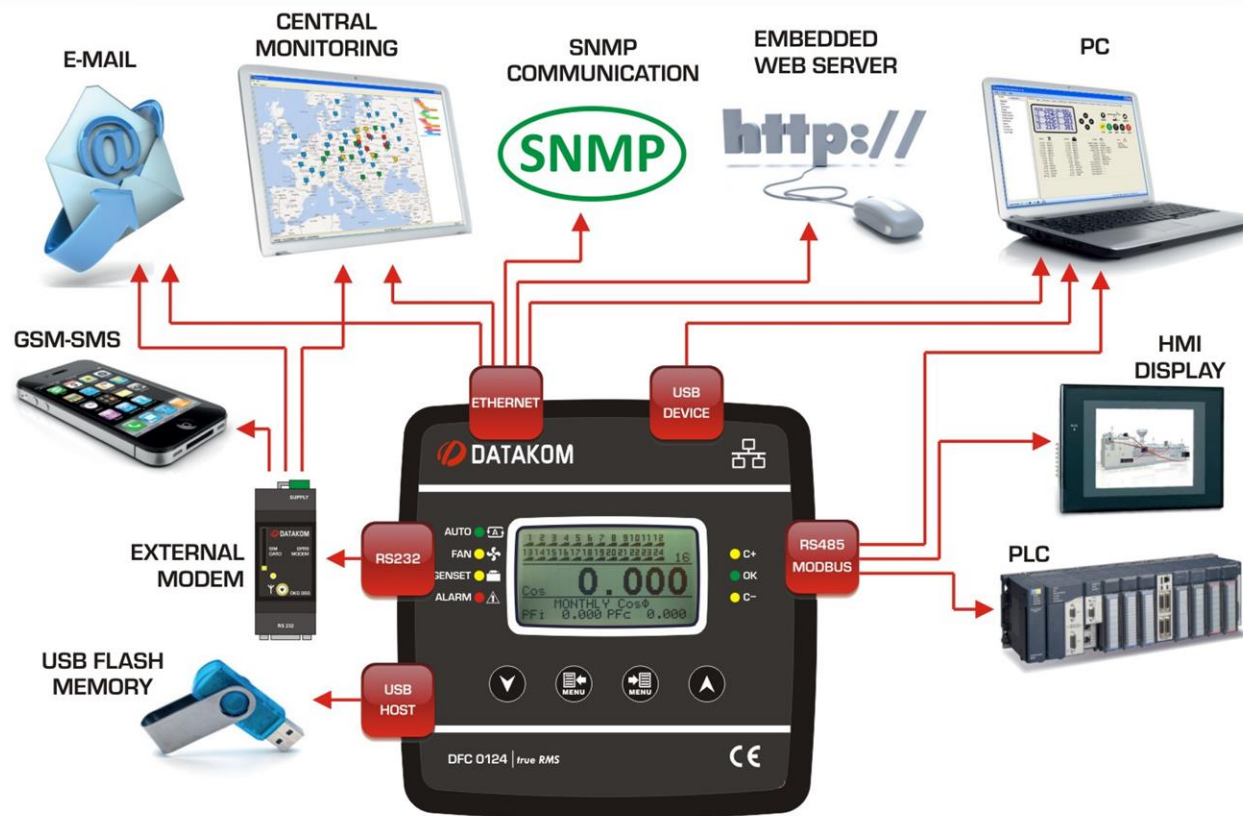


# DFC-0124 POWER FACTOR CONTROLLER AND REMOTE MONITORING SYSTEM

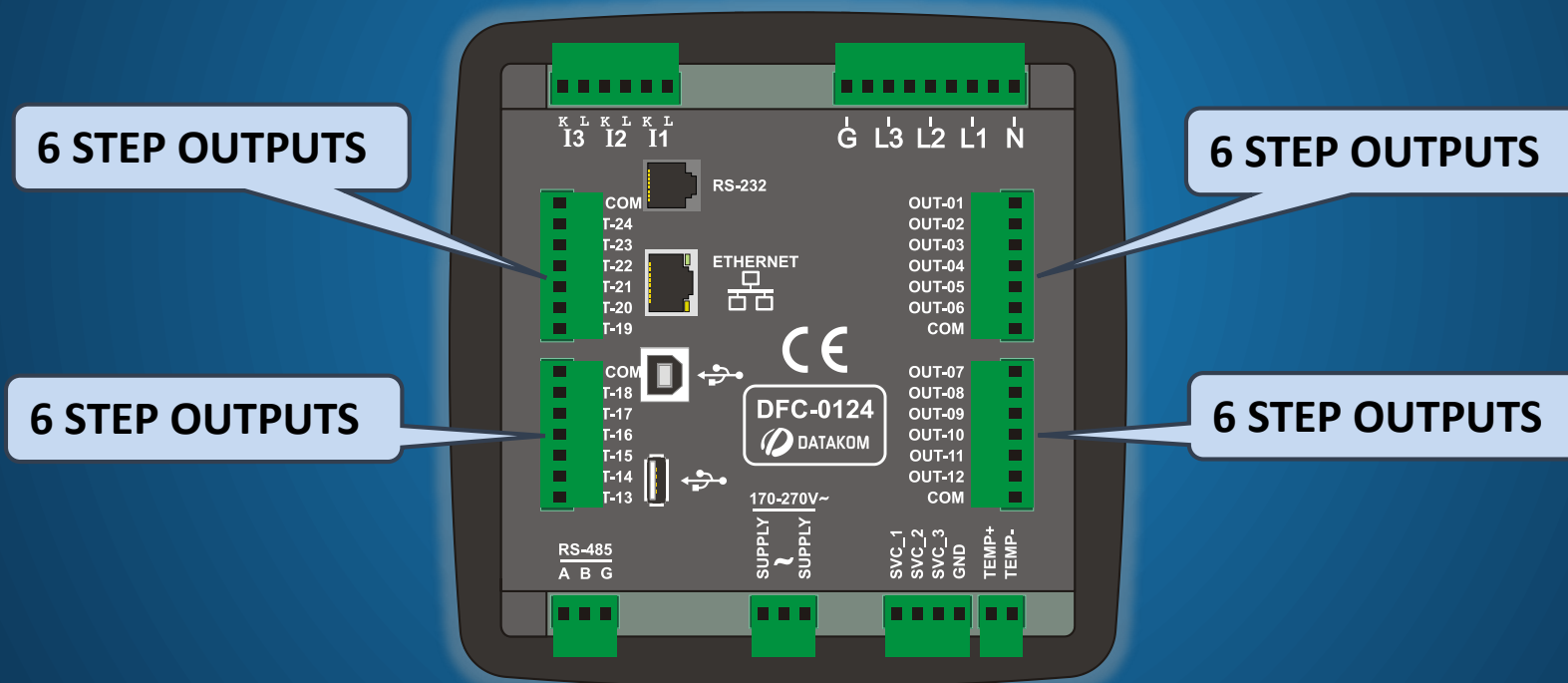


# TOMORROW'S TECHNOLOGY AVAILABLE TODAY





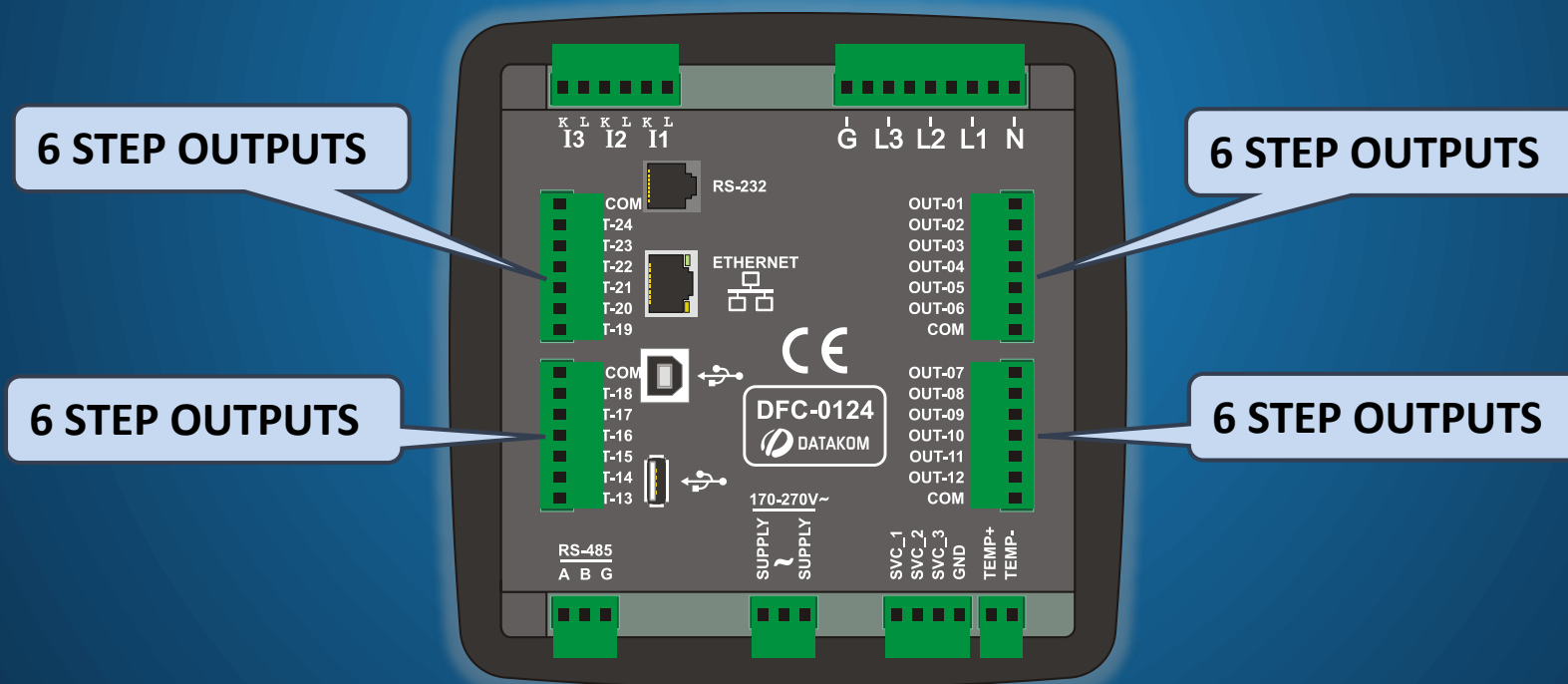
# 24 STEP OUTPUTS





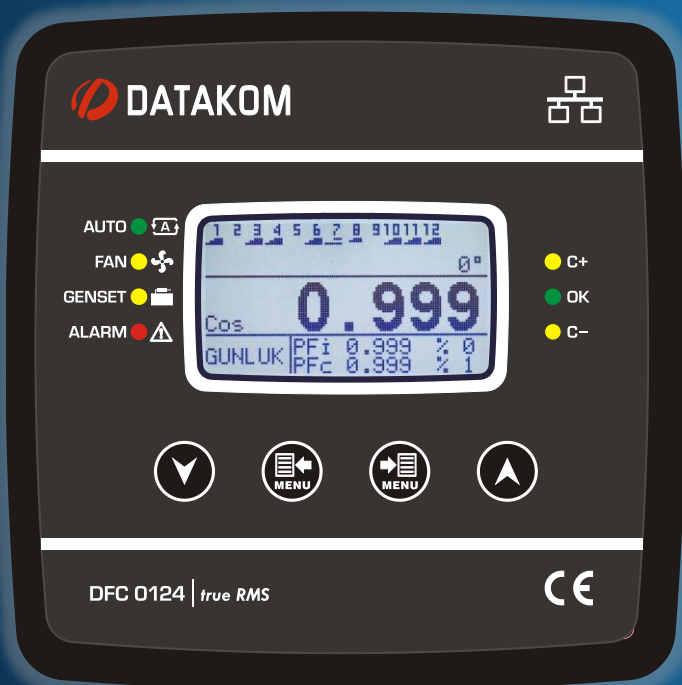
# CONTACTOR AND STATIC SWITCH OUTPUTS AVAILABLE

EACH GROUP OF 6 CAN BE SELECTED AS CONTACTOR OR STATIC SWITCH OUTPUTS





## COMPENSATES FAST CHANGING LOADS



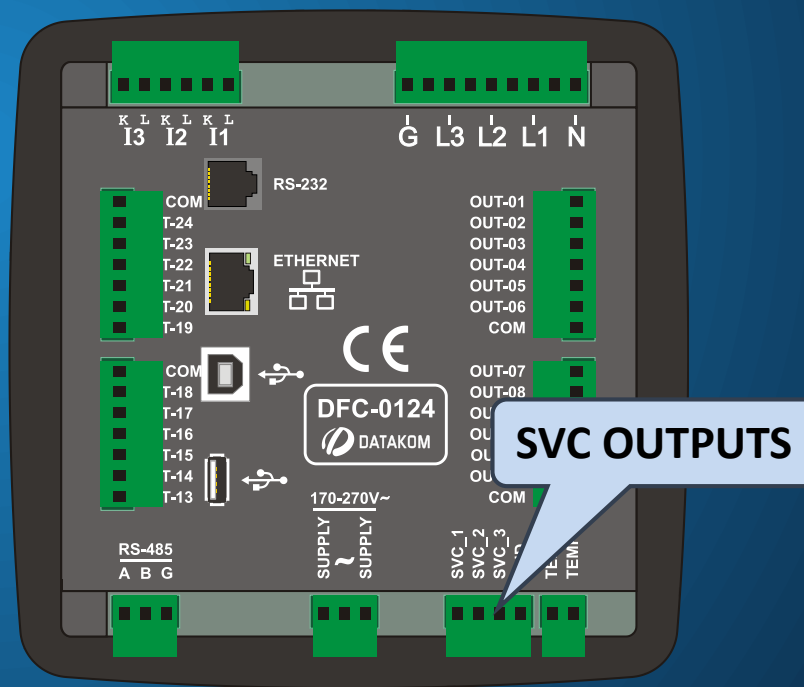
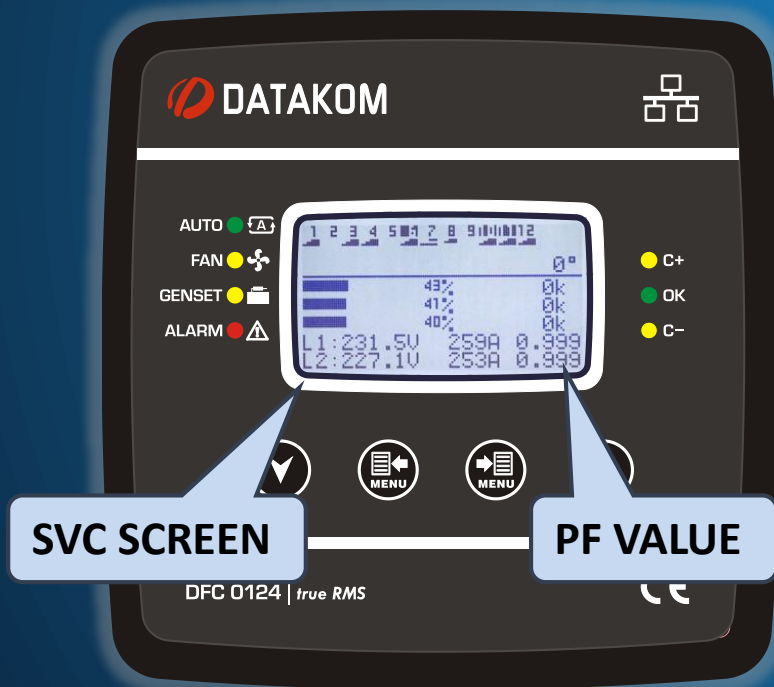
MEASUREMENT PERIOD: 20 – 100ms (ADJUSTABLE)

CORRECTION DELAY: 40 – 120ms



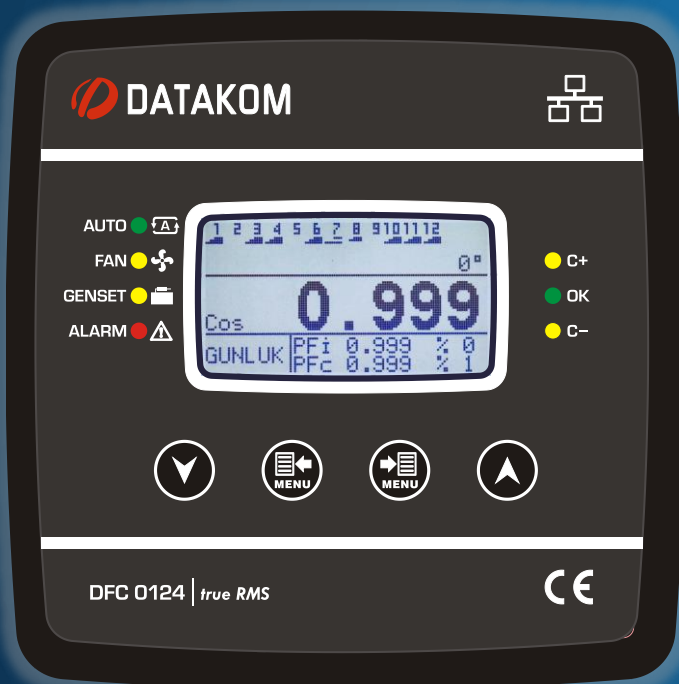
# STANDARD SVC OUTPUTS

ALWAYS EXACT COMPENSATION WITH SVC OUTPUTS





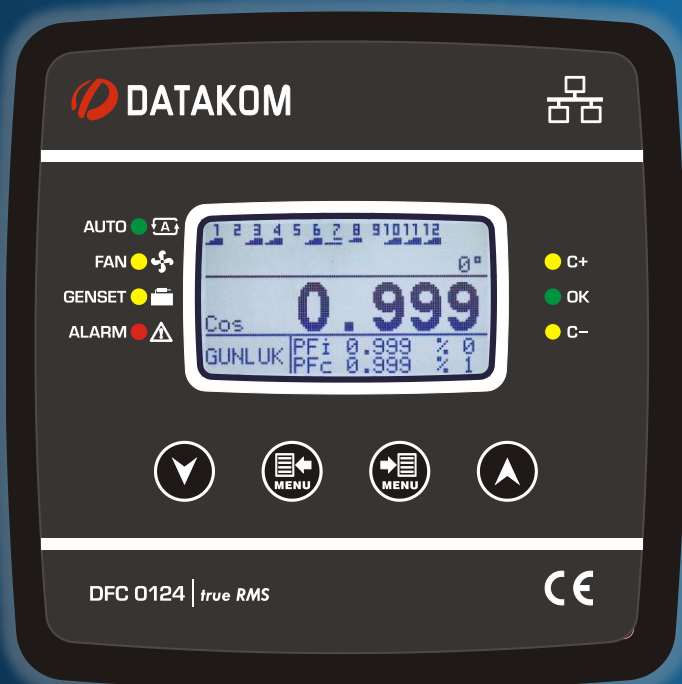
# AUTOMATIC CORRECTION OF CONNECTION FAULTS



- CORRECTS PHASE ORDER OF VOLTAGE INPUTS
- CORRECTS POLARITY OF CURRENT INPUTS
- CORRECTS ORDER OF CURRENT INPUTS



## FAST AUTO SETUP

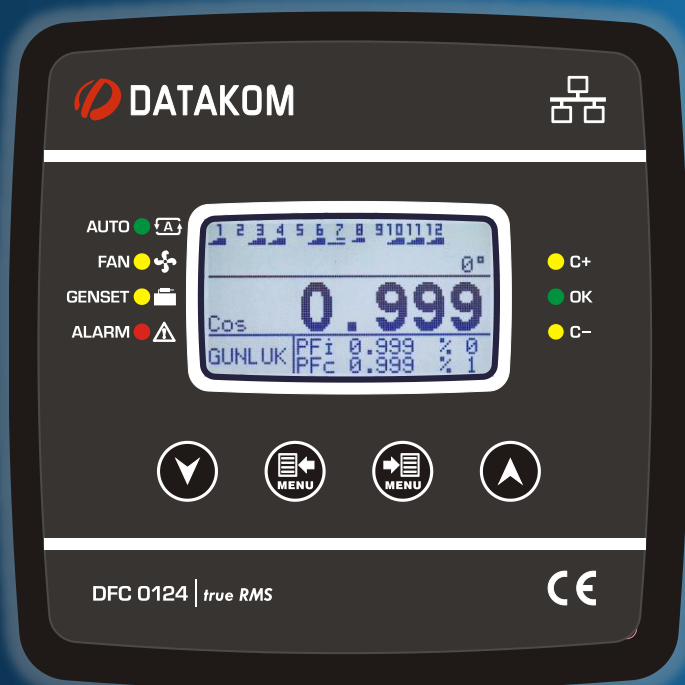


- AUTO SETUP PERFORMED UNDER LOAD
- FIRST STEP MUST BE 3-PHASE CAPACITOR
- OTHER STEPS CAN BE 1 – 2 – 3 PHASED
- STEPS MAY BE SHUNT REACTORS
- REPEATS AUTO SETUP ONCE PER MONTH





# CONTINUOUS MEASUREMENT OF STEP VALUES



- MEASURES AND UPDATES CONTINUOUSLY ALL STEP RATINGS
- GIVES ALARM IN CASE OF LOSS OF RATING
- DETECTS STEP FAILURES AUTOMATICALLY



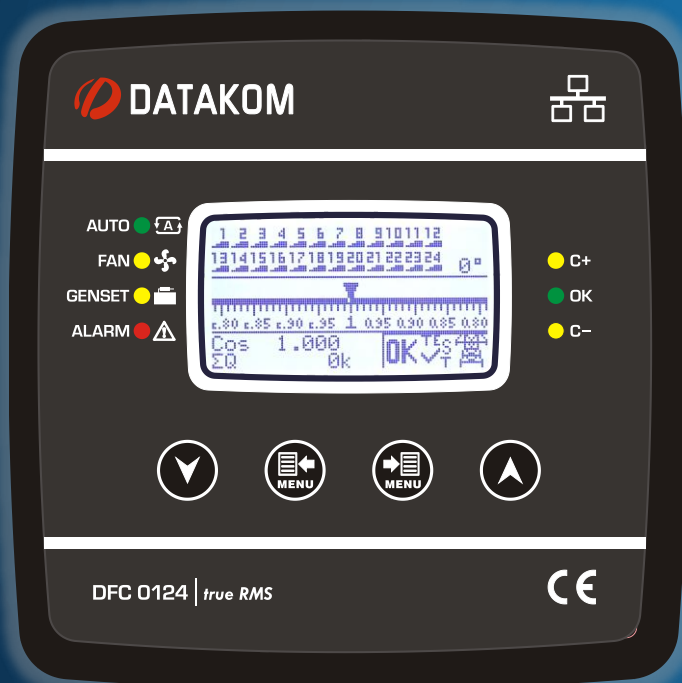
## 0.5% MEASUREMENT ACCURACY



- VOLTAGE 0.5 %
- CURRENT 0.5 %
- FREQUENCY 0.2 %
- kW – kVAr 1.0 %
- $\cos \phi$  0.5 %



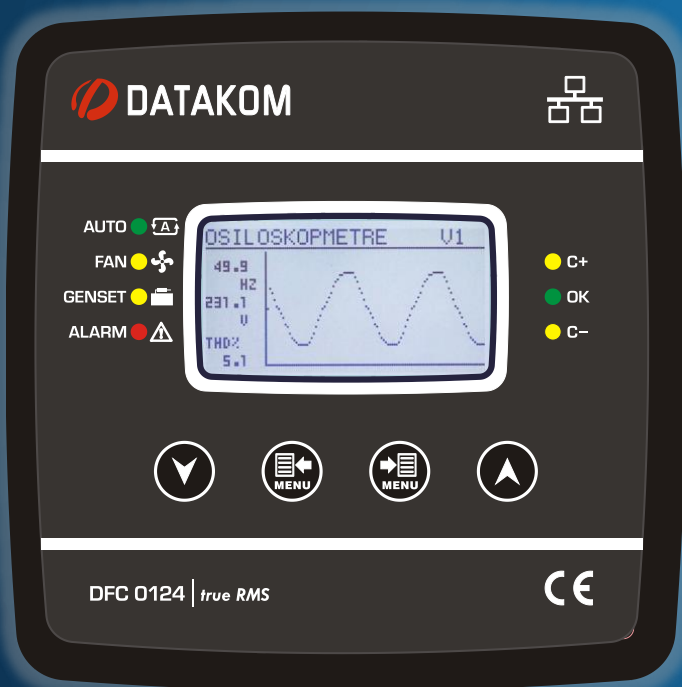
## EASY TO READ GRAPHIC LCD DISPLAY



- 128 x 64 PIXELS
- ANALOG DISPLAYS



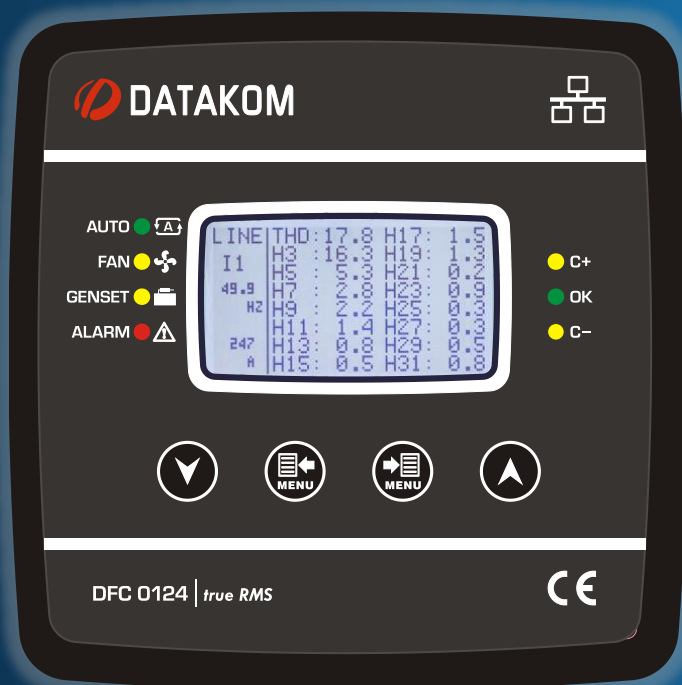
# WAVEFORM DISPLAYS



- ALL VOLTAGE & CURRENT WAVEFORMS CAN BE VISUALIZED



# HARMONIC ANALYSIS



- ALL VOLTAGE & CURRENT INPUTS ARE ANALYZED
- 1<sup>st</sup> to 31<sup>st</sup> HARMONICS DISPLAYED



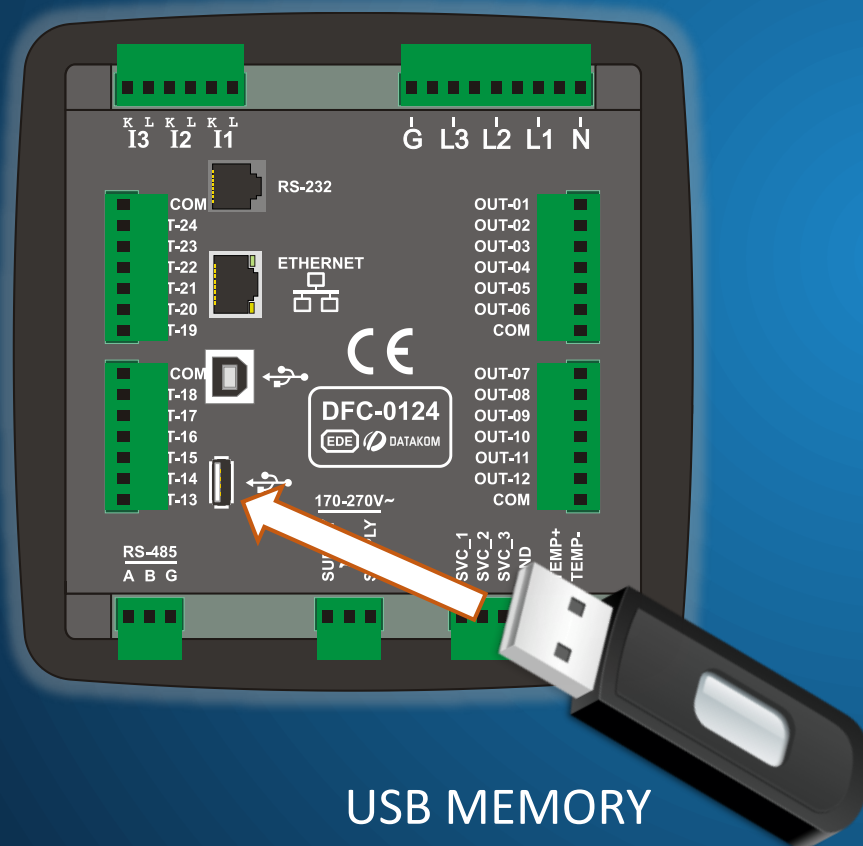
## CONFIGURABLE SCREENS



- 4 USER CONFIGURABLE SCREENS AVAILABLE
- SELECTABLE CHARACTER SIZE
- MAXIMUM 16 PARAMETERS DISPLAYED
- ANY MEASURED PARAMETER CAN BE DISPLAYED

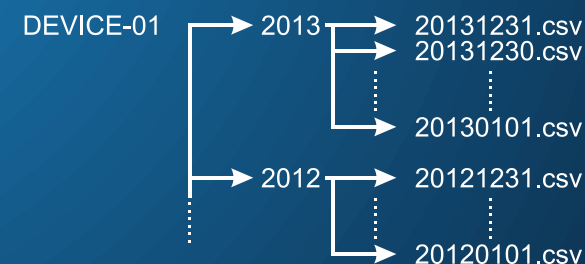


# LONG TERM DATA RECORDING



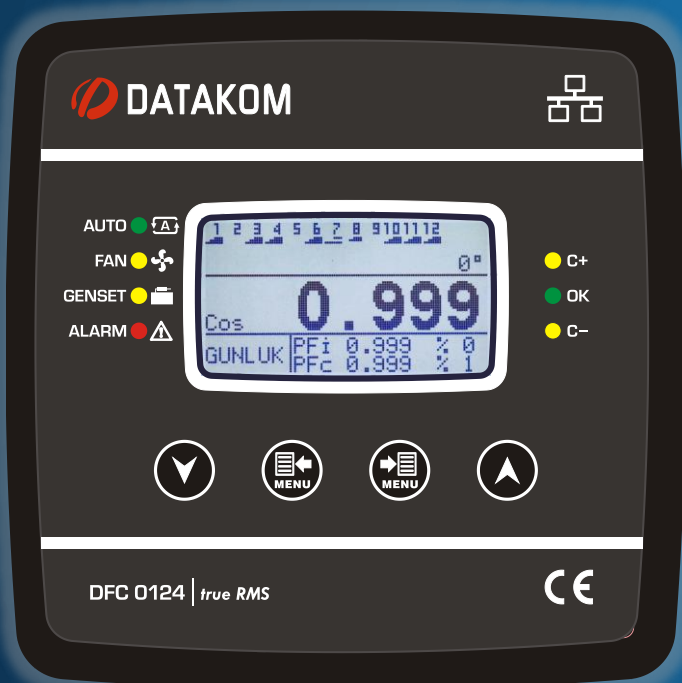
USB MEMORY

- UNLIMITED USB MEMORY CAPACITY
- RECORDS DATA IN EXCEL FORMAT
- ADJUSTABLE RECORD PERIOD
- RECORDS ALL MEASUREMENTS





## 250 EVENT RECORDS



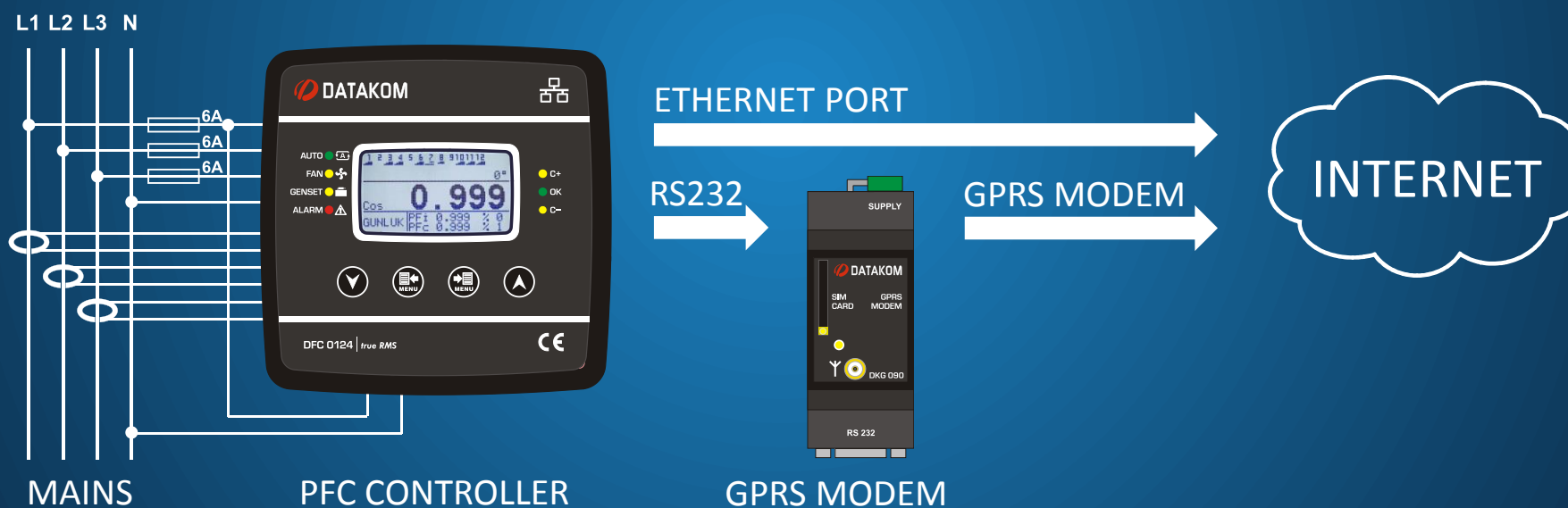
- WITH DATE & TIME STAMP
- WITH SNAPSHOT OF MEASUREMENTS
- EVENTS DOWNLOADABLE TO COMPUTER





# INTERNET COMMUNICATIONS

## LAN + GPRS CONNECTIVITY





# INTERNET COMMUNICATIONS



RAINBOW SCADA  
SERVER



RAINBOW SCADA Ver:130314

File Help

Map Device

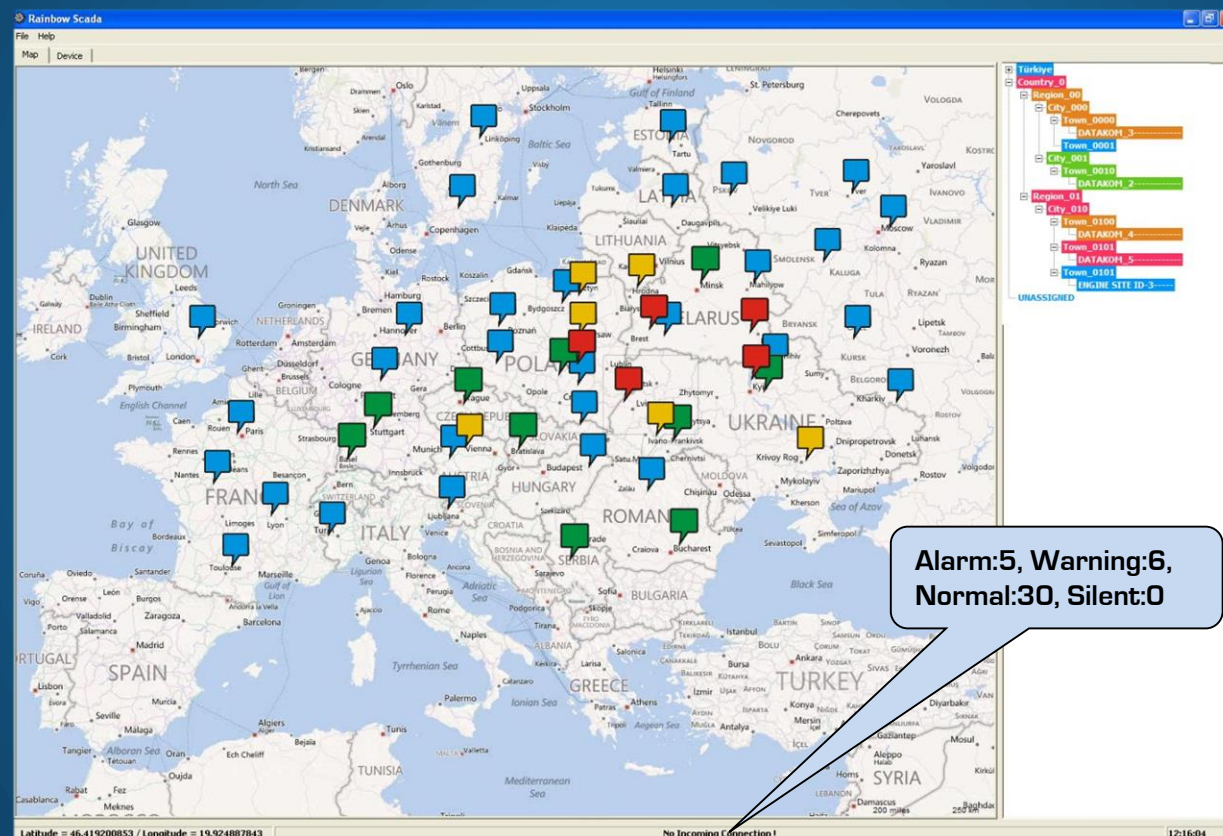
Summary Measurements Capacitors Demand/Min/Max/Counters Statistics Alarms

Summary	Measurements	Capacitors	Demand/Min/Max/Counters	Statistics	Alarms
This Month = 0.0 kW	This Month = 0.0 kVarI	This Month = 0.0 kVarC			
-1.Month = 0.0 kW	-1.Month = 0.0 kVarI	-1.Month = 0.0 kVarC			
-2.Month = 0.0 kW	-2.Month = 0.0 kVarI	-2.Month = 0.0 kVarC			
-3.Month = 996159.9 kW	-3.Month = 12.0 kVarI	-3.Month = 0.0 kVarC			
Today = 31.5 kW	Today = 0.2 kVarI	Today = 0.5 kVarC			
-1.Day = 0.0 kW	-1.Day = 0.0 kVarI	-1.Day = 0.0 kVarC			
-2.Day = 0.0 kW	-2.Day = 0.0 kVarI	-2.Day = 0.0 kVarC			
-3.Day = 0.0 kW	-3.Day = 0.0 kVarI	-3.Day = 0.0 kVarC			
-4.Day = 0.0 kW	-4.Day = 0.0 kVarI	-4.Day = 0.0 kVarC			
-5.Day = 0.0 kW	-5.Day = 0.0 kVarI	-5.Day = 0.0 kVarC			
-6.Day = 0.0 kW	-6.Day = 0.0 kVarI	-6.Day = 0.0 kVarC			
-7.Day = 0.0 kW	-7.Day = 0.0 kVarI	-7.Day = 0.0 kVarC			
-8.Day = 0.0 kW	-8.Day = 0.0 kVarI	-8.Day = 0.0 kVarC			

MONITORING SOFTWARE



# DISPLAYING 60'000 UNITS ON ONE SCREEN



**ALARM** **WARNING** **SILENT** **RUNNING** **REST**



# DETAILED MONITORING

RETURN TO MAP

INSTANT MEASUREMENTS

STEP INFORMATION

ENERGY COUNTERS

COMMUNICATION INFORMATION

ALARMS AND WARNINGS

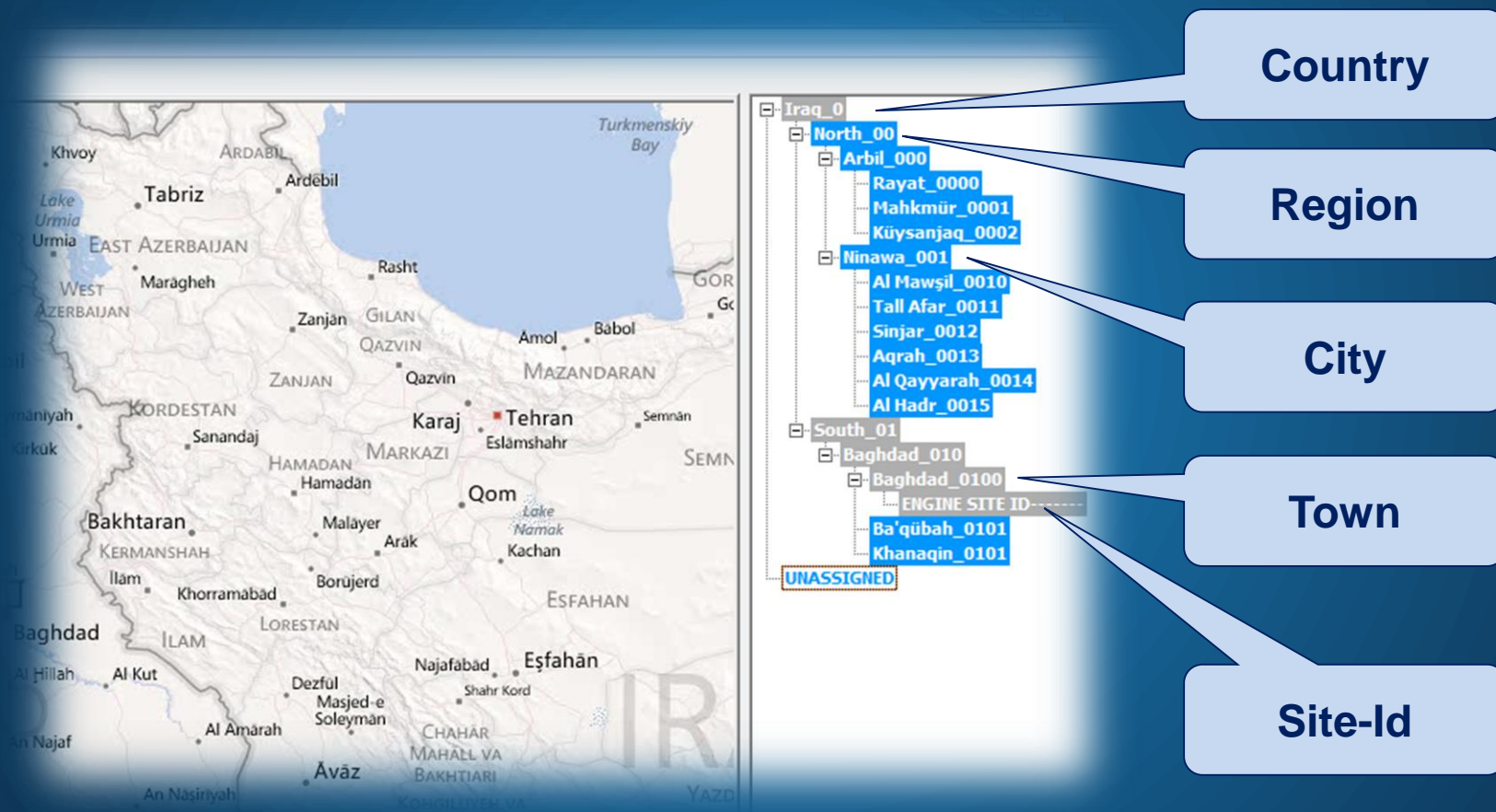
DEMAND AND MIN-MAX VALUES

The screenshot shows the Rainbow Scada monitoring interface for device 0314. The interface includes a menu bar with 'Map' and 'Device' options, and a tabbed navigation system with tabs for 'Summary', 'Measurements', 'Capacitors', 'Demand/Min/Max/Counters', 'Statistics', and 'Alarms'. The 'Measurements' tab is active, displaying a grid of electrical parameters:

V1 = 210.9 V	P1 = 50.78 kW	THD_V1 = 3.2	Frequency = 49.97 Hz
V2 = 204.4 V	P2 = 48.73 kW	THD_V2 = 3.1	V_internal = 19.6 Vdc
V3 = 216.4 V	P3 = 53.47 kW	THD_V3 = 3.1	V_avr = 210.4 V
U12 = 363.9 V	Q1 = -0.81 kVAr	THD_U12 = 2.8	U_avr = 364.3 V
U23 = 362.7 V	Q2 = 0.18 kVAr	THD_U23 = 2.7	I_avr = 241.9 A
U31 = 367.4 V	Q3 = 0.19 kVAr	THD_U31 = 2.6	
I1 = 240.9 A	S1 = 50.77 kVA	THD_I1 = 3.3	
I2 = 238.5 A	S2 = 48.72 kVA	THD_I2 = 3.1	
I3 = 247.1 A	S3 = 53.44 kVA	THD_I3 = 2.6	
In = 24.3 A		THD_In = 67.0	
P_tot = 152.98 kW			
Q_tot = -0.44 kVAr			
S_tot = 152.93 kVA			
pf_avg = -0.999'	pf_L1 = -0.999'		
Q/P_avg = 0.2'	pf_L2 = 0.999'		
	pf_L3 = 0.999'		
	Q/P_L1 = 1.6'		
	Q/P_L2 = 0.6'		
	Q/P_L3 = 0.1'		



# GROUPING OF CENTERS





# EMBEDDED WEB SITE

REACH THE UNIT FROM ANYWHERE IN THE WORLD WITH A WEB BROWSER

### WEB Scada

ANA EKRAN OLCUMLER SAYACLAR OLAY KAYIT ALARMLAR KADEMELER

SITE ID : DATAKOM/DFC0124-----  
SERI NO : 1234567890-----  
ALARM : Alarm Yok  
MOD : TEST  
COS : 1.000

AYLIK PERFORMANS							
TARİH	kWh	kVarh-I	kVarh-C	COS (I)	TAN (I) (°)	COS (C)	TAN (C) (°)
3/2013	0.0	0.0	0.0	0.000	0.0	0.000	0.0
2/2013	-	-	-	-	-	-	-
1/2013	-	-	-	-	-	-	-
12/2012	-	-	-	-	-	-	-
11/2012	-	-	-	-	-	-	-
10/2012	-	-	-	-	-	-	-
9/2012	-	-	-	-	-	-	-

GÜNLÜK PERFORMANS							
TARİH	kWh	kVarh-I	kVarh-C	COS (I)	TAN (I) (°)	COS (C)	TAN (C) (°)
23/ 3/2013	18.1	0.0	0.1	0.000	0.0	0.999	0.5

### WEB Scada

ANA EKRAN OLCUMLER SAYACLAR OLAY KAYIT ALARMLAR

SEBEKE		GUC		THD	
L1 Volt	210.3V	Top P	164 k	THD L1	1.8
L2 Volt	209.8V	Top Q	40 k	THD L2	2.9
L3 Volt	214.8V	Top S	169 k	THD L3	3.1
L12 Volt	364.5V	PowFactor	0.971	THD L12	2.2
L23 Volt	367.8V	Demand I1	0 A	THD L23	3.0
L31 Volt	367.2V	Demand I2	0 A	THD L31	3.1
L1 Akim	256A	Demand I3	0 A	THD I1	1.7
L2 Akim	274A	Demand Io	0 A	THD I2	5.6
L3 Akim	268A	Demand P	0 k	THD I3	3.5
N Akim	20A	Demand Q	0 k	THD In	84.8
Frekans	50.00 Hz				
V-ort	211.6V				
U-ort	366.5V				
I-ort	266A				

### WEB Scada

ANA EKRAN OLCUMLER SAYACLAR

SAYACLAR

SEBEKE

Import Guc (kWh1-Im) 2.0 kWh  
Export Guc (kWh1-Ex) 0.0 kWh  
Enduktif Guc (kVarh1-In) 0.0 kVarh  
Kapasitif Guc (kVarh1-Cp) 0.0 kVarh

JENERATOR

Import Guc (kWh2-Im) 0.0 kWh  
Export Guc (kWh2-Ex) 0.0 kWh  
Enduktif Guc (kVarh2-In) 0.0 kVarh  
Kapasitif Guc (kVarh2-Cp) 0.0 kVarh

### WEB Scada

ANA EKRAN OLCUMLER SAYACLAR OLAY KAYIT ALARMLAR KADEMELER

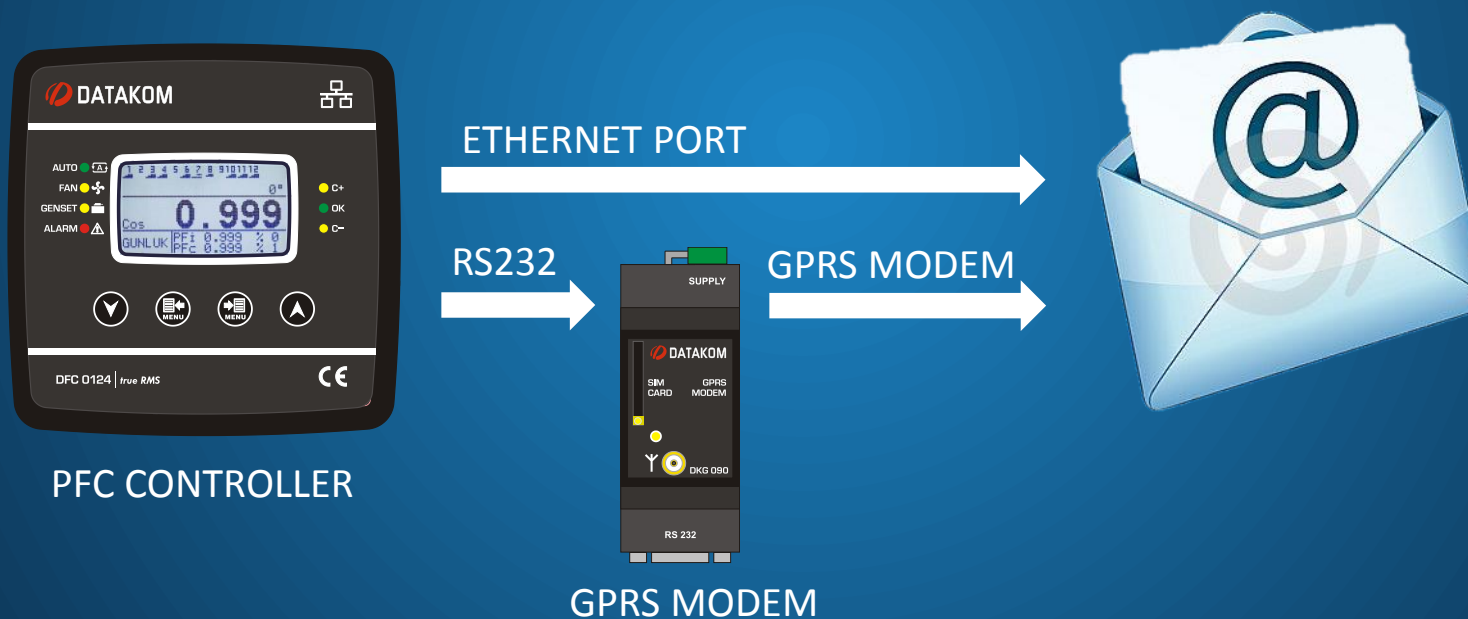
KADEMELER				
NO	TIP	DEKRE	ÇALIŞMA SAATI	DEĞİŞİK ÜSRE ANAHI
1	C / L123	3.0 kVar	0.0 hr	0
2	C / L123	3.0 kVar	0.0 hr	0
3	C / L123	3.0 kVar	0.0 hr	0
4	C / L123	3.0 kVar	0.0 hr	0
5	C / L123	3.0 kVar	0.0 hr	0
6	C / L123	3.0 kVar	0.0 hr	0
7	C / L123	3.0 kVar	0.0 hr	0
8	C / L123	3.0 kVar	0.0 hr	0
9	C / L123	3.0 kVar	0.0 hr	0
10	C / L123	3.0 kVar	0.0 hr	0
11	C / L123	3.0 kVar	0.0 hr	0
12	C / L123	3.0 kVar	0.0 hr	0
13	C / L123	3.0 kVar	0.0 hr	0
14	C / L123	3.0 kVar	0.0 hr	0
15	C / L123	3.0 kVar	0.0 hr	0
16	C / L123	3.0 kVar	0.0 hr	0
17	C / L123	3.0 kVar	0.0 hr	0
18	C / L123	3.0 kVar	0.0 hr	0
19	C / L123	3.0 kVar	0.0 hr	0
20	C / L123	3.0 kVar	0.0 hr	0
21	C / L123	3.0 kVar	0.0 hr	0
22	C / L123	3.0 kVar	0.0 hr	0
23	C / L123	3.0 kVar	0.0 hr	0
24	C / L123	3.0 kVar	0.0 hr	0
25	C / L123	3.0 kVar	0.0 hr	0

- DAILY PERFORMANCE
- MONTHLY PERFORMANCE
- INSTANT MEASUREMENTS
- ENERGY COUNTERS
- EVENT RECORDS
- ALARMS AND WARNINGS
- STEP CONFIGURATIONS
- STEP RATINGS
- STEP RUN HOURS
- STEP SWITCHING COUNTERS



# E-MAIL SENDING ON FAULT

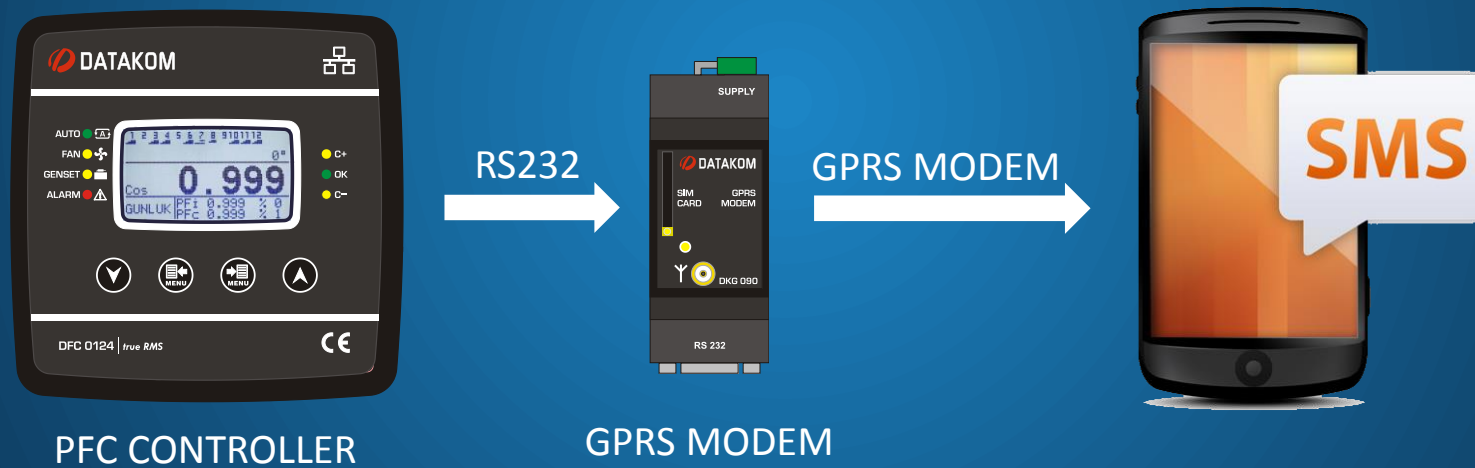
BE AWARE OF FAULTS ANYTIME





# SMS SENDING ON FAULT

BE AWARE OF FAULTS ANYTIME - ANYWHERE







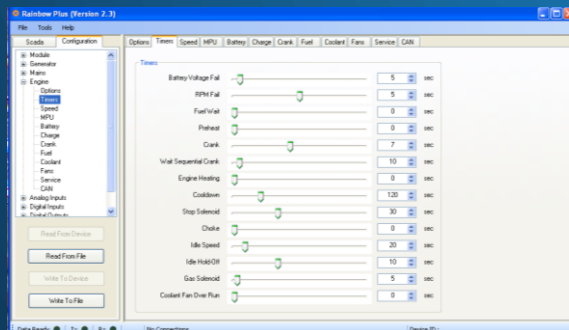
# REMOTE PARAMETER EDITING

MANAGE YOUR SITE FROM YOUR DESK !

RAINBOW SCADA  
SERVER



PFC CONTROLLER

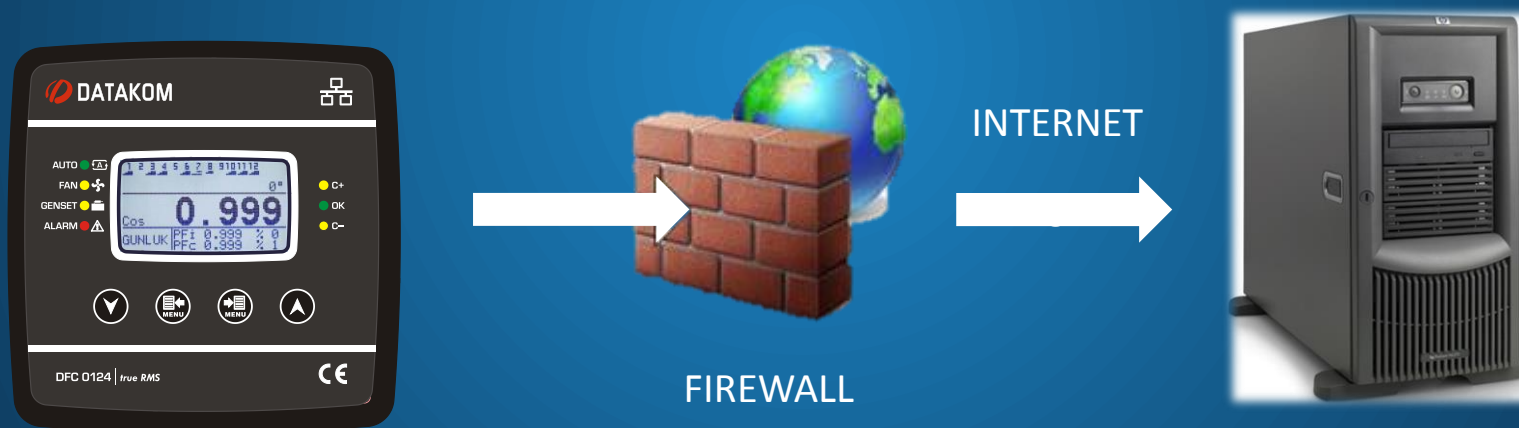


RAINBOW PLUS  
SOFTWARE



# DATA SECURITY

DATA IS SENT TO YOUR CONTROL CENTER ONLY !



NOBODY CAN REACH YOUR DEVICE BEHIND FIREWALL !



## EASY INSTALLATION

CONTROLLERS CAN WORK WITH LOCAL IP THROUGH LAN



RAINBOW SCADA  
SERVER

- NO STATIC IP REQUIRED !
- NO ADDITIONAL DATA SERVER REQUIRED !



## COST EFFECTIVE

TRANSMIT DATA WITH LESS COST !



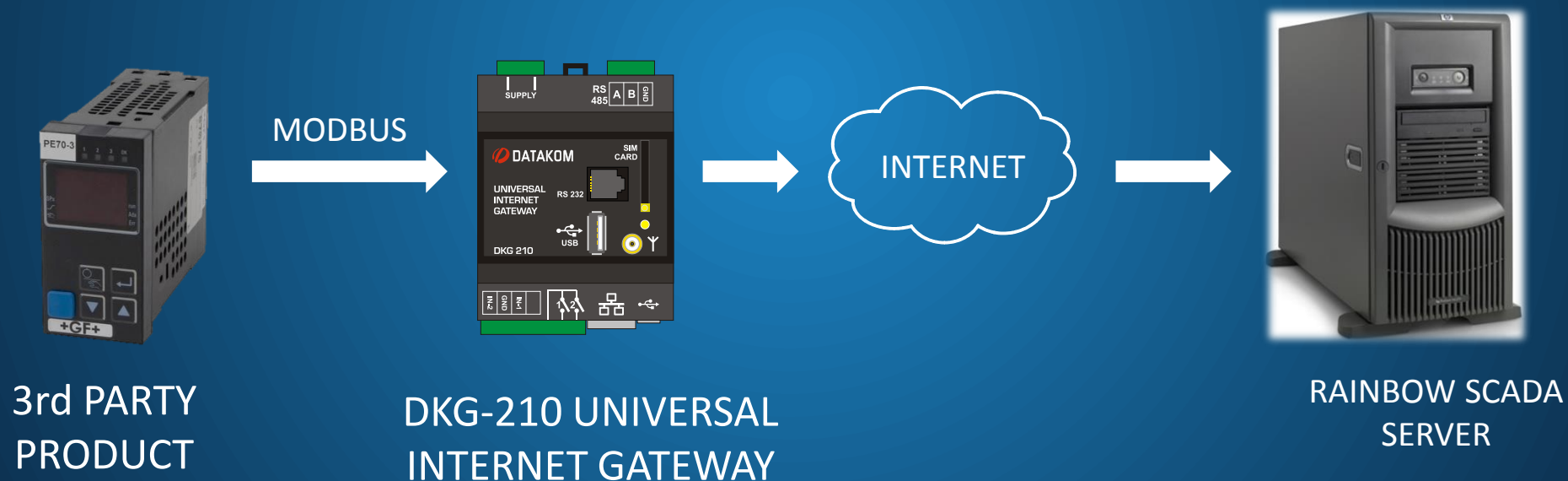
RAINBOW SCADA  
SERVER

- THE DEVICE SENDS IP PACKETS TO THE DATA CENTER AUTOMATICALLY
- ALL INFORMATION IS SENT WITHIN A SINGLE DATA PACKET
- NO NEED TO QUERRY THE UNIT FROM THE DATA CENTER !



# INTEGRAL APPROACH

INTEGRATE THIRD PARTY PRODUCTS IN THE SAME NETWORK





# AUXILIARY CONTROL RELAY OUTPUTS

CONTROL YOUR REMOTE STATION VIA DFC-0124



RAINBOW SCADA  
SERVER



PFC CONTROLLER





# IMMEDIATE FAULT DETECTION

---

REDUCE DOWN TIME WITH FASTER INTERVENTION



**YES !**



**NO !**



## USE LESS MANPOWER FOR SERVICING

---

AVOID UNNECESSARY SITE VISITS



**NO !**



**YES !**





## ADVANTAGES

---

- 24 STEPS, CAN DRIVE CONTACTORS AND STATIC SWITCHES
- ACCURATE COMPENSATION WITH SVC OUTPUTS
- FAST COMPENSATION (40ms), ACCURATE AND DETAILED MEASUREMENTS
- AUTOMATIC CONNECTION CORRECTION, AUTOMATIC SETUP
- LONG TERM DATA RECORDING
- INTERNET MONITORING
- 2 YEARS FREE REMOTE MONITORING
- IMMEDIATE FAULT DETECTION THROUGH INTERNET
- REDUCE YOUR NON-COMPENSATED TIME WITH FASTER INTERVENTION
- AVOID UNNECESSARY SITE VISITS
- LESS DOWN TIME, BETTER COMPENSATION QUALITY
- SECURE DATA FLOW
- INTEGRATE THIRD PARTY PRODUCTS IN THE SAME NETWORK