



# DKM-411

Power Analyzer  
with Internet communication

Now  
UL

- Color TFT screen
- IP communications
- Harmonic analysis
- Scopemeter

The DKM-411 is a UL Listed, advanced precision metering device offering a 3.5" size, 320 x 240 pixel color TFT, together with unrivaled remote monitoring capabilities over internet in a compact and low cost package.

The unit itself is a web page and can be opened through any browser for remote monitoring.

The central monitoring feature allows monitoring of thousands of meters from one central PC.



## FEATURES

- True RMS measurements, 0.2% accuracy
- 3.5" TFT LCD, 320x240 pixels
- Harmonic distortion display (63 harmonics)
- Oscilloscope, waveform display
- Phasor diagram display
- Internal battery backed-up real time clock
- Max demand display
- User configurable display screen
- 2 configurable relay outputs
- Energy pulse output capability
- 2 opto-isolated, configurable digital inputs
- Dual active-reactive power counters
- Both mains/generator energy metering
- Configurable user counters
- Voltage transformer ratio for MV applications
- Password protected front panel programming
- Reduced panel depth
- Sealed front panel (IP54)

## MEASUREMENTS

- Phase to phase voltages: L1L2-L2L3-L3L1-Lavg
- Phase to neutral voltages: V1-V2-V3-Vavg
- Phase currents: L1-L2-L3-LN-Lavg-Ltot
- Active power: P1-P2-P3-ΣP
- Reactive power: Q1-Q2-A3-ΣQ
- Apparent power: S1-S2-S3-ΣS
- Power factor: cos1-cos2-cos3-Σcos
- Active power counters: pC1-pC2
- Reactive power counters: Qc1-Qc2
- User Counters: USR1-USR2-USR3-USR4
- 2...63 Harmonics of any voltage or current
- Phase to neutral voltages vector angles
- Phase to phase voltages vector angles
- Phasor vector diagram

## COMMUNICATIONS

- Modbus RTU RS-485
- Modbus TCP/IP
- SNMP
- TCP/IP server
- TCP/IP client
- UDP
- SMTP
- Embedded web server
- Web monitoring
- Web programming
- GSM-SMS sending
- email sending
- Central Monitoring through IP
- Free configuration & monitoring software

## COMMUNICATION PORTS

- Ethernet 10/100Mb
- RS-485 Isolated (Modbus RTU)
- RS-232 for external GPRS modem
- USB Host for data recording on flash memory
- USB Device for PC connection

## SUPPORTED TOPOLOGIES

- 3 phases 4 wires, star
- 3 phases 3 wires, 3 CT's
- 3 phases 3 wires, 2 CT's (L1-L2)
- 3 phases 3 wires, 2 CT's (L1-L3)
- 3 phases 4 wires, delta
- 3 phases 3 wires, L1-L2
- 3 phases 3 wires, L1-L3
- 1 phase 2 wires

## APPROVALS

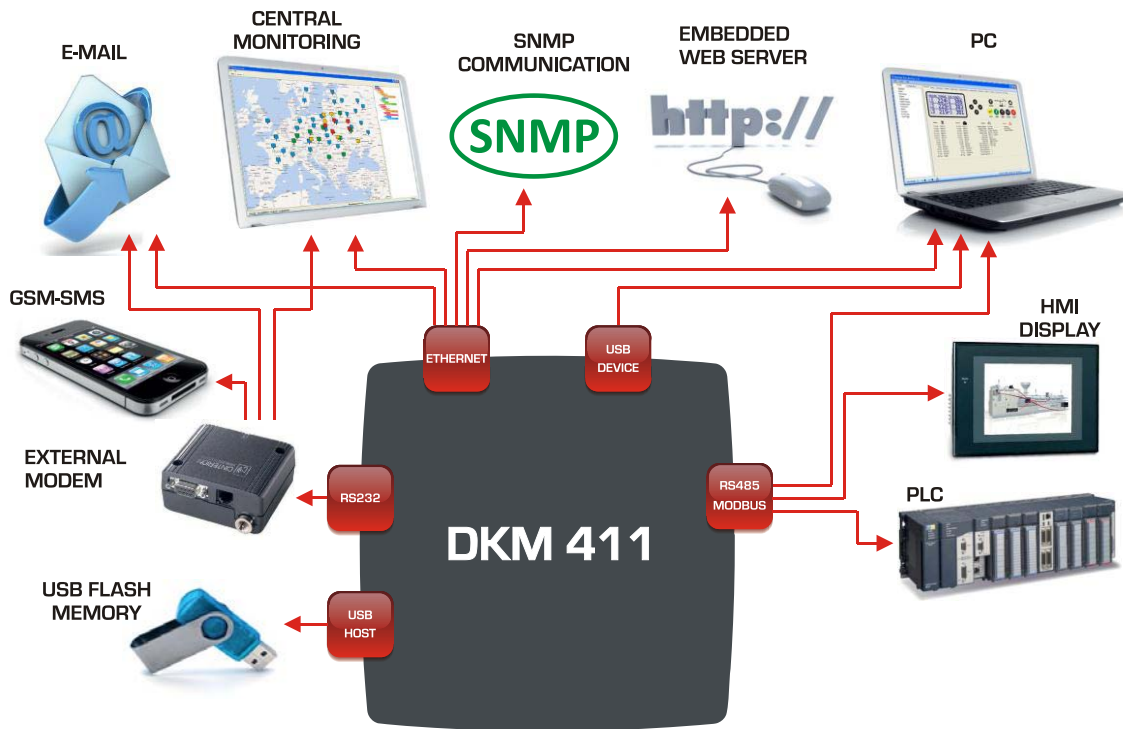
- UL, C-UL (UL File E475547), CE

What's New!



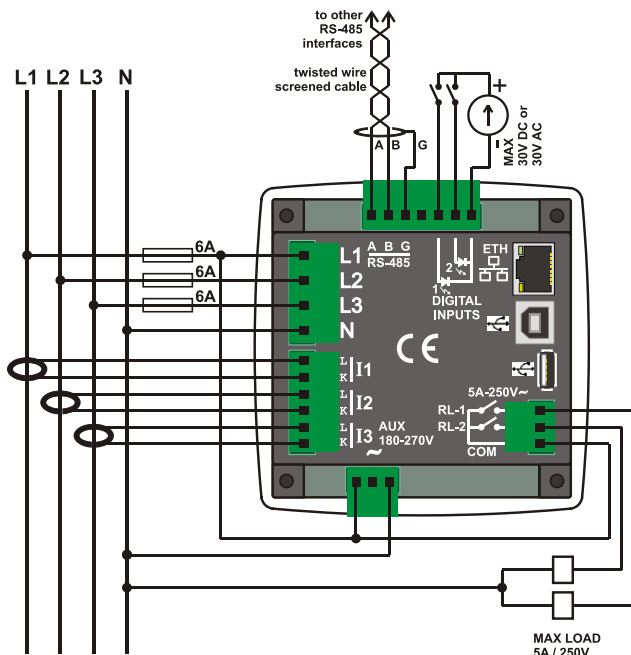
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## COMMUNICATION DIAGRAM



## CONNECTION DIAGRAM

### 230/400V SYSTEM



## TECHNICAL SPECIFICATION

### Power Supply Input:

220V input: 180 to 270V AC  
 110V input: 90 to 140V AC  
 50 - 60Hz nominal ( $\pm 10\%$ )  
 DC supply versions available

### Power Consumption:

< 5 VA

### Measurement Input Range:

**Voltage:** 5 - 400 V AC (L-N)  
 10 - 520 V AC (L-L)  
**Current:** 0.1 - 10 A AC  
**Frequency:** 30 - 100 Hz

### Accuracy:

**Voltage:** 0.2%+1digit  
**Current:** 0.2%+1 digit  
**Frequency:** 0.1%+1 digit  
**Power(kW,kVAr):** 0.4%+2digit  
**Power factor:** 0.2%+1digit

### Measurement Range:

**CT range:** 5/5A to 10'000/5A  
**VT range:** 0.1/1 to 200.0/1  
**kW range:** 0.1 kW to 50 MW

### Voltage burden:

< 0.1VA per phase

### Current burden:

< 1VA per phase

### Relay Outputs:

5A @ 250V AC

### Digital Inputs:

**Active level:** 5 to 30V-DC or AC  
**Min pulse:** 250ms.  
**Isolation:** 1000V AC, 1 minute

### Operating Temperature:

-20°C to +50°C (-4 to +176 °F)

### Maximum humidity:

95% non-condensing.

### Degree of Protection:

IP 65 (Front), IP 30 (Back)

### Enclosure:

Non-flammable, ROHS compliant

### Installation:

Flush mounting with rear brackets

### Dimensions:

102x102x53mm (WxHxD)

### Panel Cutout:

92x92mm

### Weight:

1.06 lbs. (480 gr)

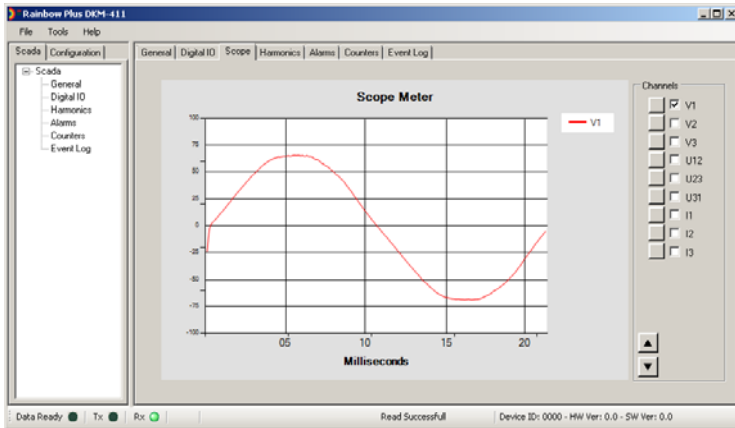
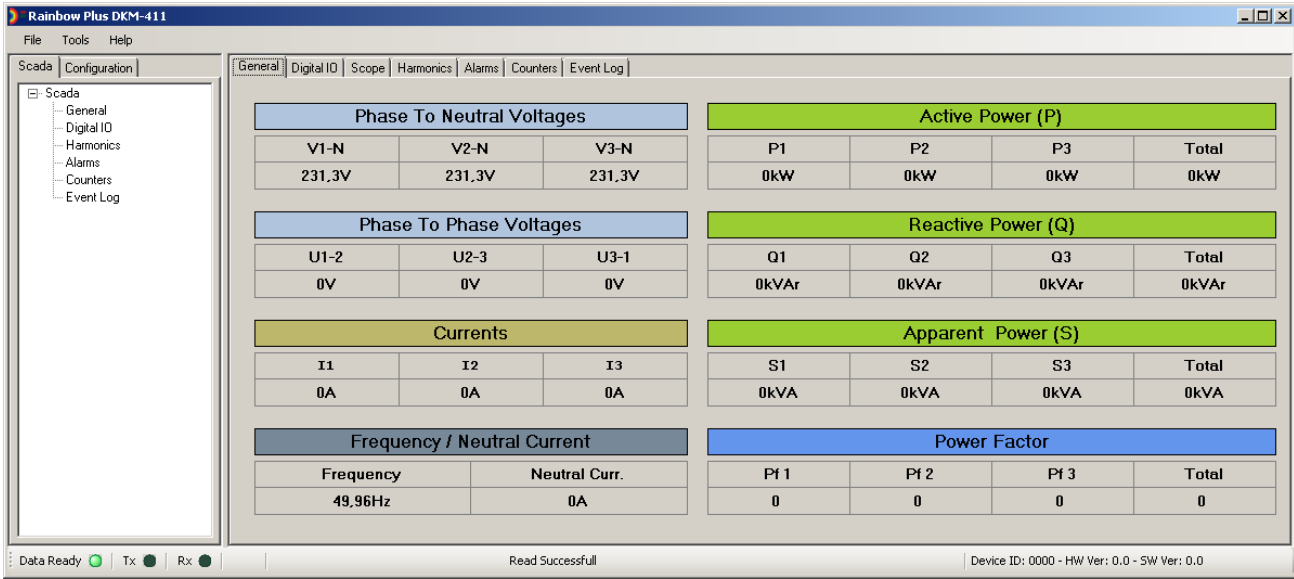
### EU Directives:

2006/95/EC (LVD)  
 2004/108/EC (EMC)

### Norms of reference:

EN 61010 (safety)  
 EN 61326 (EMC)

# RAINBOW PROGRAM



**Rainbow Plus 2.5**

Cancel Scada Data

Serial Port
  TCP/IP
  USB
  Rainbow Scada

TCP/IP Settings:

IP Address: 192.168.2.6    Device Address: 1

Modbus Port: 502    Scan Interval: 1500 ms

No Connection    State    TX    RX

**Configuration - Timers**

Options: Timers | Voltage | Frequency | Current | Load

Module: Electrical, Inputs, Outputs, Communication

Buttons: Read From Device, Read From File, Write To Device, Write To File

**Timers**

- Duration Time for Volt. Alarms: 30 sec
- Duration Time for Freq. Alarms: 30 sec
- Dur. Time for Act. Pow. Alarms: 30 sec
- Dur. Time Reac. Pow. Alarms: 30 sec
- Dur. Time for Cos. Alarm: 30 sec
- Dur. Time for Current Alarm: 30 sec
- Dur. Time for THD-V Alarm: 30 sec
- Dur. Time for THD-I Alarm: 30 sec
- Volt. Unbalance Duration: 30 sec
- Curr. Unbalance Duration: 30 sec

Status: Data Ready (Tx, Rx), Read Successful, Device ID: 0000 - HW Ver: 0.0 - SW Ver: 0.0

# CENTRAL MONITORING

The screenshot displays the Rainbow Scada interface. On the left, a map of Europe shows various locations marked with colored icons (blue, green, yellow, red). On the right, a tree view shows a hierarchy of devices including Turkey, Country\_0, Region\_01, and various City\_000 and Region\_000 entries. The main window shows detailed data for a device with the following information:

- UniqueID = 000114145409575388:
- Latitude = 41.001037598
- Longitude = 29.151548386
- Device Type = D411
- SW Version = 1.3
- HW Version = 0.1
- Last Update Date = 04/03/2013
- Last Update Time = 17:53:43
- Device Date = 04/03/2013
- Device Time = 17:53:16
- WAN-IP = 55.56.46.49
- LAN-IP = 192.168.2.6
- GSM-IP = 0.0.0.0
- Client-IP = 192.168.2.6:10002
- SITE-ID = DATAKOM/DKM411
- Serial Number = 1234567890
- ModBus Port = 502
- ModBus Addr = 1
- GSM Connection = 0

The Alarms section shows a red background with the text: "Shutdown: High Voltage Alarm,". At the bottom right, a status bar indicates: "1, Warning : 0, Running : 0, Normal : 0, Si 17:54:36".

# EMBEDDED WEB SERVER

The screenshot shows a web browser displaying the WEB Scada interface. The page title is "WEB Scada" and the URL is "http://192.168.2.43". The interface includes a navigation menu with "Measurements", "Counters", "Events", and "Alarms". The "Measurements" section is active, showing the following data:

LINE	Volt	Tot P	Tot Q	Tot R	THD L1	THD L2	THD L3	THD In
L1 Volt	230.2 V		200.7 kW		0.4 %			
L2 Volt	230.1 V		51.1 kVAR		1.6 %			
L3 Volt	230.1 V		207.1 kVA		1.6 %			
L12 Volt	399.0 V		0.959 kVA		1.9 %			
L23 Volt	398.6 V		300.2 A		8.3 %			
L31 Volt	398.5 V		300.6 A		2.1 %			
L1 Amps	300.5 A		300.4 A		0.4 %			
L2 Amps	300.1 A		300.5 A		1.5 %			
L3 Amps	300.3 A		207.4 A		1.6 %			
N Amps	0.0 A		51.3 kVAR		0.0 %			
Frequency	50.00 Hz							
V-avg1	230.1 V							
V-avg2	398.7 V							
V-avg3	300.3 A							

Web Monitoring

The screenshot shows the "Counters" section of the WEB Scada interface. The data is as follows:

Counter	Value
Import Power (kWh1-Im)	1369.2 kWh
Export Power (kWh1-Ex)	504.3 kWh
Inductive Power (kVACh1-Im)	13.8 kVAch
Capacitive Power (kVACh1-Cp)	42.4 kVAch
Import Power (kWh2-Im)	0.0 kWh
Export Power (kWh2-Ex)	0.0 kWh
Inductive Power (kVACh2-Im)	0.0 kVAch
Capacitive Power (kVACh2-Cp)	0.0 kVAch
Input Counter 1 (InCnt-1)	0
Input Counter 2 (InCnt-2)	0

Web Monitoring

The screenshot shows the "Events" section of the WEB Scada interface. The event log is as follows:

Event	Event Name	Time	Status	Value	THD L1	THD L2	THD L3	THD In	Frequency	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
0	Processor 0	28-03-2002 04:30:43	OK	276 Y	276 Y	276 Y	276 Y	276 Y	30.0 Hz	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y
1	Processor 1	28-03-2002 04:30:43	OK	276 Y	276 Y	276 Y	276 Y	276 Y	30.0 Hz	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y
2	Processor 2	28-03-2002 04:30:43	OK	276 Y	276 Y	276 Y	276 Y	276 Y	30.0 Hz	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y
3	Processor 3	28-03-2002 04:30:43	OK	276 Y	276 Y	276 Y	276 Y	276 Y	30.0 Hz	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y
4	Processor 4	28-03-2002 04:30:43	OK	276 Y	276 Y	276 Y	276 Y	276 Y	30.0 Hz	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y
5	Processor 5	28-03-2002 04:30:43	OK	276 Y	276 Y	276 Y	276 Y	276 Y	30.0 Hz	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y
6	Processor 6	28-03-2002 04:30:43	OK	276 Y	276 Y	276 Y	276 Y	276 Y	30.0 Hz	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y
7	Processor 7	28-03-2002 04:30:43	OK	276 Y	276 Y	276 Y	276 Y	276 Y	30.0 Hz	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y
8	Processor 8	28-03-2002 04:30:43	OK	276 Y	276 Y	276 Y	276 Y	276 Y	30.0 Hz	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y
9	Processor 9	28-03-2002 04:30:43	OK	276 Y	276 Y	276 Y	276 Y	276 Y	30.0 Hz	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y
10	Processor 10	28-03-2002 04:30:43	OK	276 Y	276 Y	276 Y	276 Y	276 Y	30.0 Hz	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y
11	Processor 11	28-03-2002 04:30:43	OK	276 Y	276 Y	276 Y	276 Y	276 Y	30.0 Hz	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y
12	Processor 12	28-03-2002 04:30:43	OK	276 Y	276 Y	276 Y	276 Y	276 Y	30.0 Hz	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y
13	Processor 13	28-03-2002 04:30:43	OK	276 Y	276 Y	276 Y	276 Y	276 Y	30.0 Hz	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y
14	Processor 14	28-03-2002 04:30:43	OK	276 Y	276 Y	276 Y	276 Y	276 Y	30.0 Hz	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y
15	Processor 15	28-03-2002 04:30:43	OK	276 Y	276 Y	276 Y	276 Y	276 Y	30.0 Hz	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y	305 Y

Event Log Display



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