DKM-409-PRO-AT NETWORK ANALYSER WITH HARMONIC MEASUREMENT AND SCOPEMETER

The DKM-409 is a precision instrument designed for displaying various AC parameters in 3-phase distribution panels.

The unit has 3 x 4-20mA analog outputs. Any measurement can be output as analog value.

The unit has 4 digital inputs and 2 relay outputs with programmable functionality, selected from a list.

Thanks to its isolated RS-485 Modbus RTU communication port, the device is free from ground potential difference issues and measured parameters are safely transferred to automation systems.

SAFETY NOTICE
Failure to follow below instructions may result in death or serious injury

* Electrical equipment should be installed only by qualified specialist. No responsibility is assured by the manufacturer or any of its subsidiaries for any consequences resulting from the non-compliance to these instructions.

* Check the unit for cracks and damages due to transportation. Do not install damaged equipment.

* Do not open the unit. There is no serviceable parts inside.

* Fuses of fast type (FF) with a maximum rating of 6A must be connected to the power supply and phase voltage inputs, in close proximity of the unit.

* Disconnect all power before working on equipment.

* When the unit is connected to the network do not touch terminals.

* Short circuit terminals of unused current transformers.

* Any electrical parameter applied to the device must be in the range specified in the user manual.

* Do not try to clean the device with solvent or the like. Only clean with a dry cloth.

* Verify correct terminal connections before applying power.

* Only for front panel mounting.

INSTALLATION

Before installation:

- Read the user manual carefully, determine the correct connection diagram.
- Remove all connectors and mounting brackets from the unit, then pass the unit through the mounting opening.
- Put mounting brackets and tighten. Do not tighten too much, this can brake the enclosure.
- Make electrical connections with plugs removed from sockets, then place plugs to their sockets.
- Note that the power supply terminal is separated from measurement terminals.

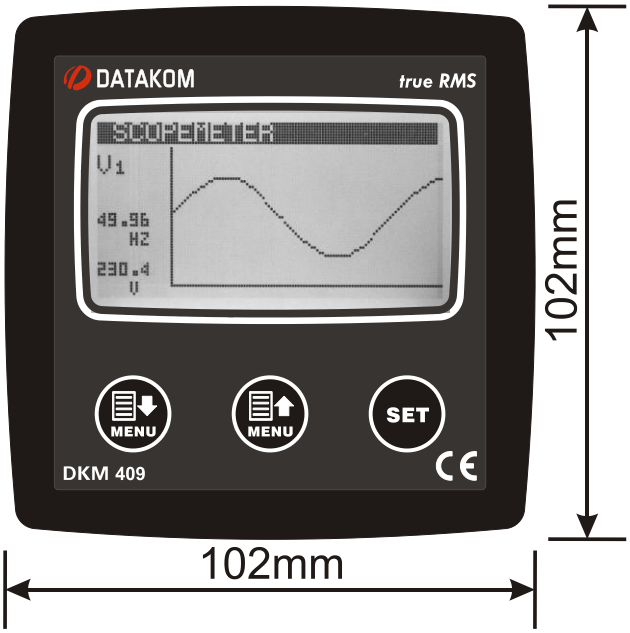
Below conditions may damage the device:

- Incorrect connections.
- Incorrect power supply voltage.
- Voltage at measuring terminals beyond specified range.
- Current at measuring terminals beyond specified range.
- Connecting or removing data terminals when the unit is powered-up.
- Overload or short circuit at relay outputs
- Voltage applied to digital inputs over specified range.
- High voltage applied to communication port.

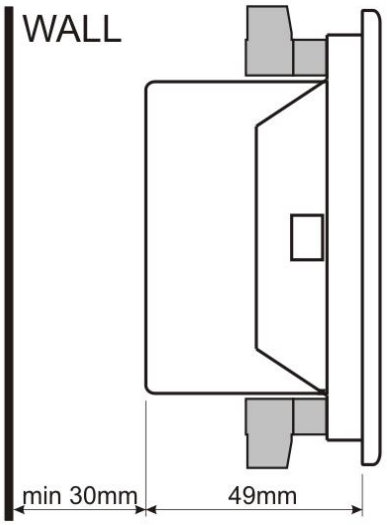
Below conditions may cause abnormal operation:

- Power supply voltage below minimum acceptable level.
- Power supply frequency out of specified limits
- Phase order of voltage inputs not correct.
- Current transformers not matching related phases.
- Current transformer polarity incorrect.

Detailed user manual of this product may be downloaded at:
www.datakom.com.tr



REQUIRED PANEL DEPTH



ELECTRICAL INSTALLATION

Do not install the unit close to high electromagnetic noise emitting devices like contactors, high current busbars, switchmode power supplies and the like.

Although the unit is protected against electromagnetic disturbance, excessive disturbance can affect the operation, measurement precision and data communication quality.

- **Use cables of appropriate temperature range.**
- **Use adequate cable section, at least 0.75mm² (AWG18).**
- **For current transformer inputs, use at least 1.5mm² section (AWG15) cable.**
- **The current transformer cable length should not exceed 1.5 meters. If longer cable is used, increase the cable section proportionally.**
- **Current transformers must have 5A output.**
- **For the RS-485 connection, use appropriate shielded twisted wire cable. Communication quality will depend highly on the cable used.**

PUSHBUTTON FUNCTIONS

Three buttons on the front panel provide access to configuration and measurement screens.

BUTTON	FUNCTION
SET	Selects next display group. **Press and hold for 3 seconds:** Removes alarms.
MENU	Selects next display screen in the same display group.
MENU	Selects previous display screen in the same display group. **Press and hold for 10 seconds:** Current screen will be the default display screen
MENU MENU	**Press and hold for 3 seconds:** Enable programming mode.

DEVICE CONFIGURATION

In order to enable the configuration menu, hold both MENU buttons pressed for 3 seconds.

When the configuration mode is entered, the password entry screen will be displayed.

A 4 digit password must be entered using buttons. The factory default password is **"9876"**. Each digit is adjusted with **MENU** buttons and the next digit is selected with **SET** button.

In order to exit the configuration menu, hold both MENU buttons pressed for 3 seconds.
If no button is pressed, the unit will automatically close the configuration menu after 30 seconds.

When the configuration mode is entered, a list of available configuration topics will be displayed as in the below screen.

Navigation on the list is made with MENU buttons. Selected configuration topic is shown in reverse video (black on white). In order to enter inside a configuration topic, please press SET button. In order to exit from the group please press and hold SET button.

Parameter value may be increased and decreased with MENU buttons.

ADJUSTING THE LCD CONTRAST

Select **LCD CONTRAST** on **CONTROLLER CONFIG** menu. Change the contrast value with **MENU** buttons until best visibility is obtained and then press **SET** to save new LCD contrast value and return back to "**CONFIGURATION MENU**".

LANGUAGE SELECTION

Select **LANGUAGE** on **CONTROLLER CONFIG** menu. Select language with **MENU** buttons then press **SET** to save the new language and return to **CONTROLLER CONFIG** menu.

CURRENT TRANSFORMER RATIO

For the correct current and power measurement, the current transformer ratio has to be set properly.

Both primary and secondary of the current transformer is adjustable.

Select "**CRNT TRF RATIO**" on **ELECTRICAL PARAMS** menu.

Then adjust the primary and secondary current transformer ratios with **MENU** buttons until required value then press **SET** button to save the new current transformer ratio and return to **CONTROLLER CONFIG** menu.

VOLTAGE TRANSFORMER RATIO

If a voltage transformer is used, then its ratio needs to be set to the unit.

The voltage transformer ratio is defined as primary voltage / secondary voltage. The secondary is always supposed 1.0. Thus only the primary is programmed.

Select **VOLT TRF RATIO** on **CONTROLLER CONFIG** menu.

Adjust the voltage transformer ratio with **MENU** buttons until required value then press **SET** button to save new voltage transformer ratio and return to **CONTROLLER CONFIG** menu.

TECHNICAL SPECIFICATIONS

Supply Input: 100-240VAC (±15%), 50/60Hz
Measurement Inputs:
Voltage: 7 - 300 V AC (P-N)
14 - 520 V AC (P-P)
Current: 0.001 – 6.00 A AC
Frequency: 30 - 100 Hz
Accuracy:
Voltage, current: 0.5% + 1 digit
Frequency: 0.5% + 1 digit
Power (kW,kVAr)**:** 1.0% + 2 digit
Cos: 0.5% + 1 digit
Withstanding:
Current: 100 A AC during 1 sec.
Voltage: 1300 V AC (continuous)
Analog Outputs: Active 4-20mA, 16 bit
Measurement Range:
CT range: 5/5A to 25000/5A
VT range: 0.1/1 to 5000.0/1
kW range: 1.0 kW to 5000 MW
Power Consumption: < 15 VA
Voltage Burden: < 0.02VA per phase
Current Burden: < 0.5VA per phase
Relay Outputs: 5A @ 250V AC

Digital Inputs:
Active level: 24 to 135V-DC or AC
Min pulse: 250ms.
Isolation: 1000V AC, 1 minute
Serial Port: RS-485, 2400-115200 bauds
Protocol: Modbus RTU
Isolation: 500V AC, 1 minute
Operating Temp. Range:
-20°C to +70 °C (-4°F to 158°F)
Max Humidity: 95%, non-condensing
IP Protection: IP 54 (Front), IP 30 (Back)
Enclosure: Non-flammable, ROHS compl.
Installation: Flush mounting
Dimensions: 102x102x53mm (WxHxD)
Panel Cutout: 92x92mm
Weight: 200 gr

EU Directives:
2006/95/EC (LVD)
2004/108/EC (EMC)

Norms of Reference:
EN 61010 (safety)
EN 61326 (EMC)

UL-CSA Certification:
UL 61010-1, 3rd Edition, 2012-05, CAN/CSA-C22.2
File: E475547, Vol. D1

CONNECTION DIAGRAM