

# DPA 500N

## DIGITAL POWER ANALYZER FOR HARMONICS & FLICKER TESTING



### FOR TESTS ACCORDING TO ...

- › EN 301489-1
- › EN 301489-17
- › EN 301489-24
- › EN 301489-7
- › EN 61000-3-2
- › EN 61000-3-3
- › EN 61000-4-15
- › EN 61000-4-7
- › EN 61000-6-1
- › EN 61000-6-2
- › IEC 60601-1-2
- › IEC 61000-3-11
- › IEC 61000-3-12 Ed.2:2011
- › IEC 61000-3-2
- › IEC 61000-3-3
- › IEC 61000-4-15 Ed.2:2010
- › IEC 61000-4-7
- › IEC 61326
- › JIS C 61000-3-2

### DPA 500N - FULL-COMPLIANT SINGLE PHASE HARMONICS AND FLICKER ANALYZER

Harmonics and interharmonics are caused by modern electronic power conditioning modules. Such, mostly non-linear, modules to control loads and to reduce power consumption is the source of voltage at unwanted frequencies superposed on the supply voltage.







Voltage fluctuations caused by varying load currents may influence the luminance or the spectral distribution of lighting systems. The impression of the unsteadiness of visual sensation induced by this light stimulus is called flicker.

The DPA500N harmonics and flicker analyzer is used for single phase applications.

### HIGHLIGHTS

- › Real-time data acquisition
- › Internal hard disk for data storage
- › 16-Bit A/D converter
- › Wide-range current input
- › Wide-range voltage input
- › Built-in lumped flicker impedance
- › High-sophisticated analyzing capability

### APPLICATION AREAS

- |   |  |
|---|--|
|  INDUSTRY    |  TELECOM          |
|  MEDICAL     |  RENEWABLE ENERGY |
|  BROADCAST   |  |
|  RESIDENTIAL |  |

## TECHNICAL DETAILS

### BENEFITS

#### THE FULLY COMPLIANT HARMONICS AND FLICKER ANALYZER

The DPA 500N is a fully compliant analyzer for harmonics and flicker as per the latest IEC/EN 61000-3-2, IEC/EN 61000-3-3 and JIS C 61000-3-2 requirements. It follows the design specifications as per IEC/EN 61000-4-7: Ed.2.1 (2009) (for Class I instruments) and IEC/EN 61000-4-15 (2010).

Based on a real-time kernel and equipped with its own harddisk it allows to record the measuring data continuously without any gaps or overlapping. The rectangular measurement window is synchronized to each group of 10 or 12 cycles of the mains supply frequency (50Hz or 60Hz) by means of a digital PLL (Phase Lock Loop). A wide-range current input (up to 50A) avoids loss of measured data due to range switching that would occur when using different shunt resistors.

The classification of the measurement can be selected at any time, before or after the measurement has been performed. During all measurements the AC supply voltage is measured simultaneously with the current. The built-in flicker impedance, which is automatically selected when doing flicker measurement, makes the DPA 500N a complete single-box unit for both harmonics and flicker analysis.

By means of an external current clamp (optional) the current range can be extended up to 140Arms and more.

### SOFTWARE

#### DPA.CONTROL - THE CONTROL AND ANALYSING SOFTWARE FOR HARMONICS AND FLICKER

dpa.control is the software tool needed for the operation of the harmonics and flicker analysing system. It offers all features to control the DPA 500N, to upload the recorded measuring data and for the classification and analysis. It includes analysis as per the latest standards as well as procedures following the former standard requirements. An easy Fail/Pass function allows fast analysis while detailed data is available for extended analysis and EUT evaluation purposes.

dpa.control offers a powerful documentation capability with direct export to Word.

### OTHER MODELS

#### DPA 500 HARMONICS AND FLICKER ANALYZER SERIES

EM TEST offers two models of analyzers for harmonics and flicker for single phase applications (DPA 500N) and three-phase applications (DPA 503). The three-phase analyzer DPA503 can be used for single phase analysis as well.

### AUXILIARY DEVICES

#### ACS 500N6 - SINGLE PHASE AC VOLTAGE SOURCE 6KVA

The ACS 500N6 single phase AC voltage source is used to provide a pure AC supply voltage for harmonics and flicker analysis as recommended by IEC/EN 61000-3-2, IEC/EN 61000-3-3 and JIS C 61000-3-2. It offers a rated power of 6kVA and the output voltage ranges up to 300V. The ACS 500N6 AC voltage source is controlled by dpa.control.

#### ACS 500N3 - SINGLE PHASE AC VOLTAGE SOURCE 3KVA

The ACS 500N3 single phase AC voltage source is used to provide a pure AC supply voltage for harmonics and flicker analysis as recommended by IEC/EN 61000-3-2, IEC/EN 61000-3-3 and JIS C 61000-3-2. It offers a rated power of 3kVA and the output voltage ranges up to 300V. This AC voltage source is used for low-power applications. The ACS 500N3 AC voltage source is controlled by dpa.control.

## TECHNICAL DETAILS

### MEASURING SYSTEM

Input channels	2 (1x current & 1x voltage)
Frequency range	15Hz - 3,000Hz
A/D converter	16 Bit
Controller	Embedded processor Pentium 200MHz
Signal processor	Motorola DSP
Memory	Internal hard disk
Category	Class I as per IEC/EN 61000-4-7

### VOLTAGE INPUT

Input range	10V - 530V rms
Overload	4,000V peak
Accuracy	Better than 0.4% of reading

### CURRENT INPUT

Input range internal	16A continuous, 50A short time
Accuracy internal	Better than 0.4% of reading Better than 0.05% rel. to 16A
Input range external	Depending on CT model used. With optionally delivered CT max. 140A
Accuracy external CT	Related to 16A 2 turns better than 0.8% 5 turns better than 0.6%

### GENERAL DATA

Temperature	0°C - 40°C
Rel. humidity	10% - 90%, non-condensing
Power supply	85V - 255V, 47Hz - 63Hz
Power	Max. 50W
Dimension	19" 3HU: 133mm x 449mm x 500mm
Weight	13kg
Insulation	Input to case 3kV rms
Interface	USB for control and data transfer

### HARMONICS ANALYSIS

As per	IEC/EN 61000-3-2 Ed.4 JIS C 61000-3-2 IEC/EN 61000-3-12 with ext. CT
Design as per	IEC/EN 61000-4-7 Ed.2.1 (2009) and IEC/EN 61000-4-7 Ed.1 (1991)
Harmonics	1st - 50th order
Grouping	IEC/EN 61000-4-7 (2009) for Interharmonics
Synchronization	PLL; accuracy better than 0.005%
Measuring window	Rectangular window with 8, 10, 12 or 16 periods)
Algorithm	FFT
Smoothing filter	1st order 1,5s digital low pass filter (on/off), selectable
Anti-aliasing filter	> 90dB
Measurement duration	More than 30 hours, limited by the capacity of the hard-disk (approx. 1MB/min of measuring data)
Display	Vrms, Irms, Ipeak, Vpeak
Harmonics	V, I, Phase, P, Q, S (2nd - 50th order)
Power information	P, Q, S, Power factor, THD(V), THD(I), Crest factor(V), Crest factor(I)

### FLICKER ANALYSIS

As per	IEC/EN 61000-3-3
Design as per	IEC/EN 61000-4-15 (2003 & 2010) 230V, 50/60 Hz and 120V, 50/60 Hz
Flicker impedance (built-in)	Line: 0.24ohm + j0.15ohm Neutral: 0.16ohm + j0.10ohm
Accuracy Pst and Plt	Better than 5%
Accuracy dmax, dc, dt	0.15%
Flicker data	Pst and Plt, Vrms, dmax, dc, dt P50%S, P10%S, P3%S, P1%S, P0.1%
Maximum values	Pst, dmax, dc, dt
Observation period	Min. 1min, selectable

# COMPETENCE WHEREVER YOU ARE



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Information about scope of delivery, visual design and technical data correspond with the state of development at time of release. Subject to change without further notice.