

PMM 1000

IEC555 FLICKER AND HARMONICS ANALYZER



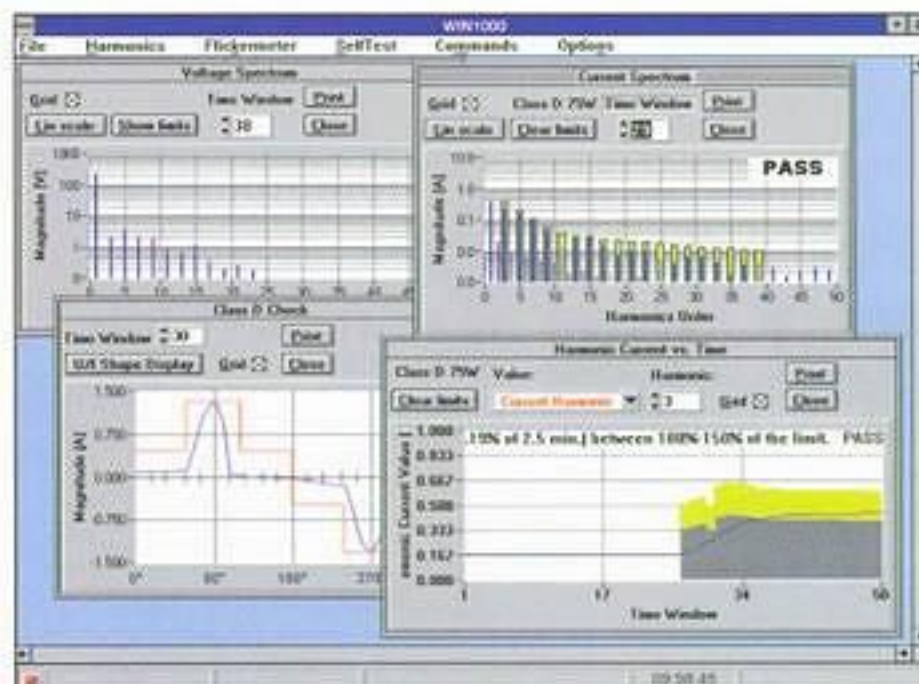
PMM 1000 is a full compliance digital instrument designed to measure harmonics, flicker and voltage fluctuations according to IEC 1000-3-2 and IEC 1000-3-3 EMC standards. The high performance provided by the equipment allows it to be perfectly suitable for laboratories, test houses and electronic equipment manufacturers. The dual processor architecture and its high resolution oversampling A/D converters grant high accuracy and repeatability to the measurements. PMM 1000 is not a simple spectrum or power analyzer modified for IEC555 testing; its hardware and firmware architecture is specifically designed to meet the requirements of the addressed standards. As harmonic analyzer it can simultaneously measure on 2 isolated input channels (1 for current and 1 for voltage) at 50 or 60 Hz; it can work on up to 40^o or 50^o harmonic, computing FFT on 2048 points based on rectangular time-windows

of 16 periods with no gaps or overlaps; for higher accuracy the sampling rate is strictly synchronized to the fundamental. Very accurate dynamic limits management for Class C and D equipment is provided: for each time-window all necessary values are continuously computed to evaluate the actual limit values in real time. Both "steady state harmonics" and "transitory harmonics" are measured. The measuring shunt has maximum drop of 150 mV at the maximum current of 49.4 Ap. As required by the international standards the main operating modes are: "Single shot" (1 time window); "2.5 minutes" measurements and data collection (469 time-windows at 50 Hz or 563 at 60 Hz), and "Continuous mode", with full management for transitory harmonics, and automatic stop when limits are overridden. The collected data are stored in a circular buffer so that the last 2.5 minutes measurement data are available. Voltage harmonics are continuously evaluated in order to check the power source during the measurement cycle, as required by IEC. The fully compliant IEC868 Flicker measurements are based on 1 input channel fully autoranging in the range 40-500 Vrms. Flicker produced by fluctuating harmonics is correctly measured. The IEEE-488 interface is optically isolated and allows the PMM1000 to be easily interfaced into larger test set-ups or to have fast data transfer to a host PC.



OPTIONS:

- 1001: IEC725 Reference Impedance 16A.
- PCIIA: IEEE-488 Interface for PC with 2m cable.
- Opt-02: Second Channel for Flicker measurements.
- Opt-03: Analog Output.
- Opt-04: Second channel real time voltage Harmonics analysis.



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GENERAL CHARACTERISTICS

Processors	Motorola DSP 56002, Intel 80C186 and 80C187
Input channel resolution	18 bit Σ/Δ A/D converter on each channel
Interface	IEEE 488
Self-test	Automatic during start-up
Power supply	180-250 Vac - 50/60 Hz and 90-125 Vac - 50/60 Hz
Max power	40 W
Case	Shielded, rack mountable, desktop and transportable versions
Size	460x448x132 mm (19" 3U)
Weight	12 kg
Operating temperature	0-50 °C
Storage temperature	-20/80 °C
Storage relative umidity	92% not condensing
Software	Windows™ based

FLICKER ANALYSIS

Reference Standards	IEC 868 + Amendment 1; IEC 555-3 + Amendment 1; IEC 1000-3-3
Input channels	1
Input channels voltage range	40-504 Vrms
Input channels frequency	50 Hz \pm 5%
Flicker produced by fluctuating harmonics	Measurement up to the 50 th harmonic
Input channels impedance	1,5 M Ω
Input channels insulation	3 kV (transformer coupled)
Missing-input-signal conditions	Automatic recognition and handling
Flicker related measurements:	CPF, P 50%S, P 10%S, P 3%S, P 1%S, P 0,1%S, P MAX, P ST, P LT
Accuracy	Higher than specified by IEC 868 and Amendment 1
Flicker classifier scales	Logarithmic
Flicker scales	2 (user selectable); 10% (1600PU) and 40% (25600PU)
Voltage fluctuation measurement	dmax, time with d(t) exceeding a programmable threshold
dc and dmax maximum error	0,2%
d(t) evaluation	RMS every half cycle
Observation period	User selectable (1-5-10-15 min.)

AC SOURCES

TPS-1500	AC Source, monophase 1.5 kVA
TPS-K10	AC Source, 3-phase 10 kVA
TPS-K20	AC Source, 3-phase 20 kVA

HARMONIC ANALYSIS

Reference Standards	IEC 555-2; IEC 1000-3-2; IEC 1000-4-7
Frequency	45-65 Hz (PLL locked)
Voltage Range	90-300 Vrms
Current Range	5 mA - 16 A with crest factor = 3
Shunt Ranges	4 user selectable: 0,16/0,8/4/20 A
Accuracy	Better than 0,2% of the rated current of the EUT (selecting appropriate shunt range)
Voltage channel input impedance	Higher than 0,8 M Ω
Current channel input impedance	Depends on the shunt range selected. Impedance < 3,034 m Ω with the highest range
Max drop on current channel	150 mV
Measured values	Magnitude and phase fundamental to 40 th or 50 th (V,I); DC component (V,I) Voltage Vrms, Current Irms; Active power (W), Apparent power (VA), Circuit power factor (λ); Harmonic distortion for voltage and current (kV% kI%)
Measuring technique	FFT on 2048 points, 16 periods rectangular windows (320 ms @50 Hz, 266,7ms @60 Hz); Sampling rate synchronized to the fundamental
Antialiasing filter	70dB
Smoothing filter for transitory harmonics	Digital 1 st order low pass filter ($\tau=1,5s$); software selectable
Operating modes	Single Shot (1 TW), 2,5 minutes and continuous (469 TW @50 Hz or 563 @60 Hz)
Stop trigger condition (user selectable)	Class C and D limits are dynamically computed each time window. Automatic management of 1,5 times over riding for 10% of period for 2 nd -10 th and 3 rd -19 th transitory harmonic.
Storage	Last 2,5 minutes in continuous mode
Self calibration	Automatic during power-up



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