

# HIOKI

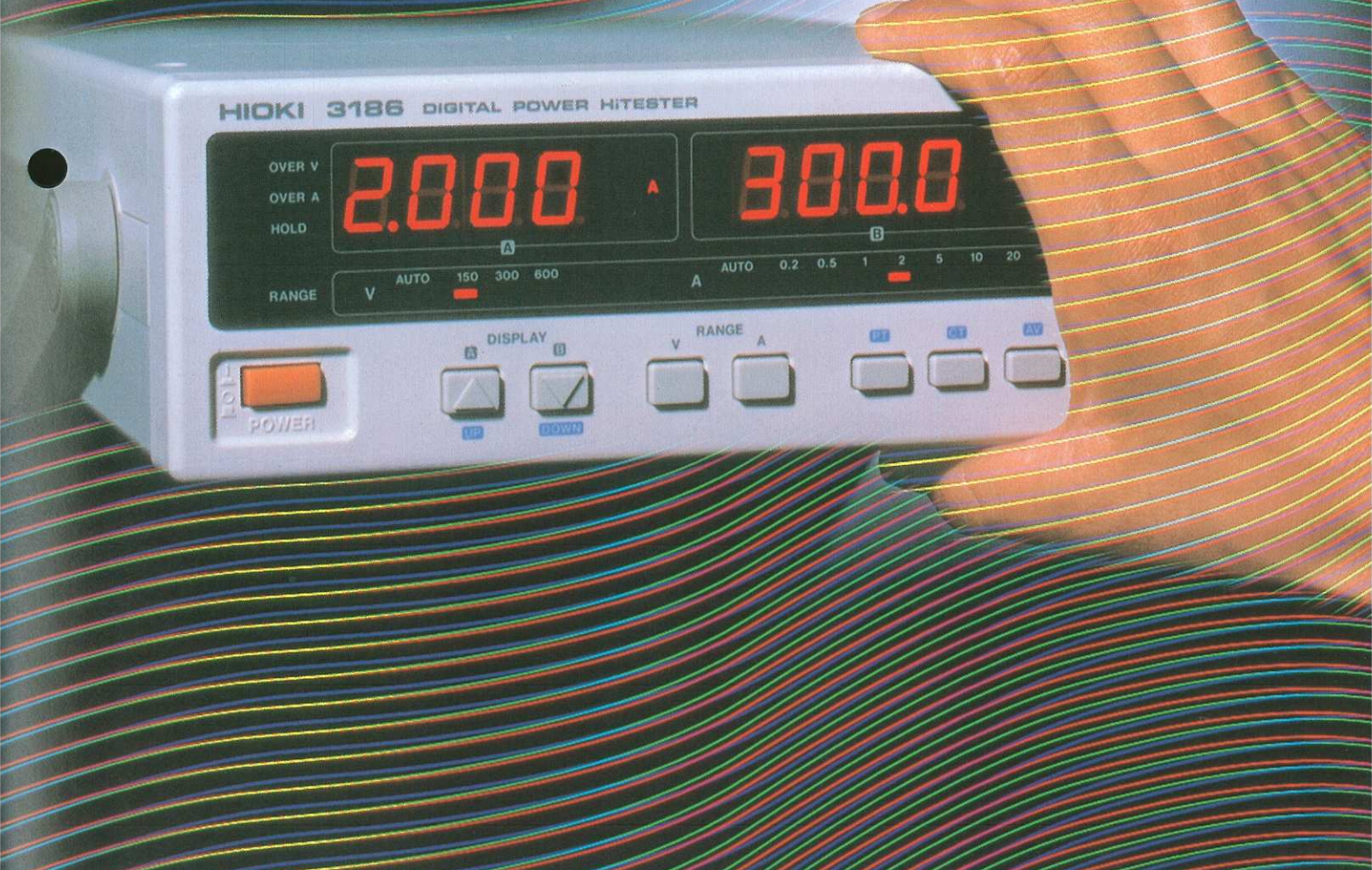


Power Meter 2002

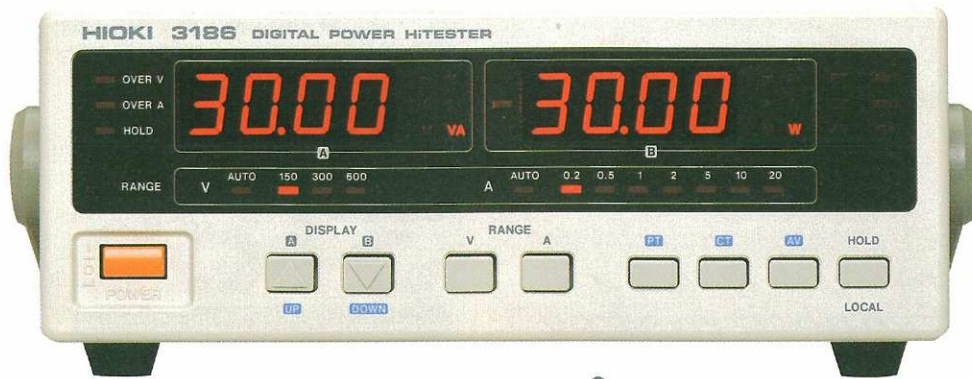
# 3186

DIGITAL POWER HITESTER

For inverter applications, a 10 Hz to 20 kHz frequency range, with 0.5% accuracy!  
***High cost-effectiveness makes this powermeter a winner***







**Full specification**

**Frequency range 10 Hz to 20 kHz**

Incorporates Hioki's specially AC zero-flux type of isolation amplifier, and covers a range from 10 Hz to 20 kHz. The voltage and current input terminals are of course insulated. The unit is ideal for power consumption monitoring of the increasingly common domestic and office electrical equipment using switching power supplies, and also for inverter-controlled equipment.

**High accuracy - 0.5%**

This unit is ideal for testing domestic and office electrical equipment. The 0.5% accuracy (measured at full scale, between 45

and 66 Hz) allows precise measurement of power consumption.

**Wide ranges**

A single unit covers three voltage ranges: 150, 300 and 600 V, and seven current ranges, from 0.2 to 20 A. Precise power monitoring is possible, with a precision in the minimum 30.00 W range of 0.01 W.

**Compact, lightweight and safe**

The cover photograph tells all. This small box packs a high-grade specification. The entire design, from the internal circuit arrangement to the input terminals, complies with the safety standards specified by Publication 348 of the IEC (the International Electrotechnical Commission).

**Ultra-wide range - 30W to 12kW - plus GP-IB automated operation  
Ideal for power monitoring for TV's**





# Industrial and office equipment applications

## Includes all essential functions

### Scaling functions for direct readout

The scaling factors for voltage and current (PT and CT ratios respectively) allow direct readout of the primary values. The setting is simple, selecting an internally stored ratio.

### Averaging function for stabilized display

The averaging function eliminates the flicker which can make digital displays harder to read.

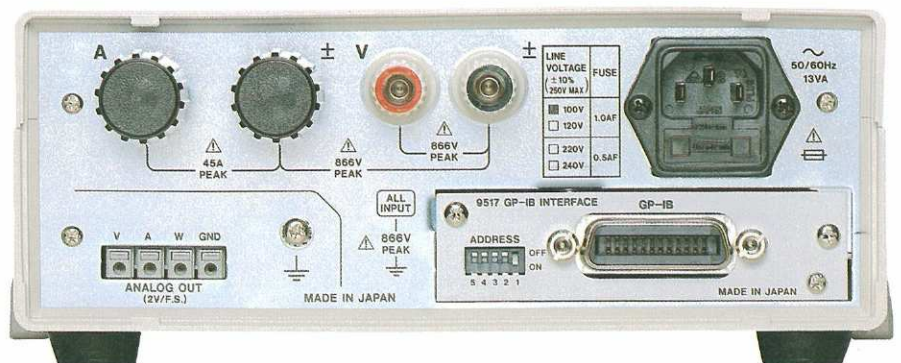
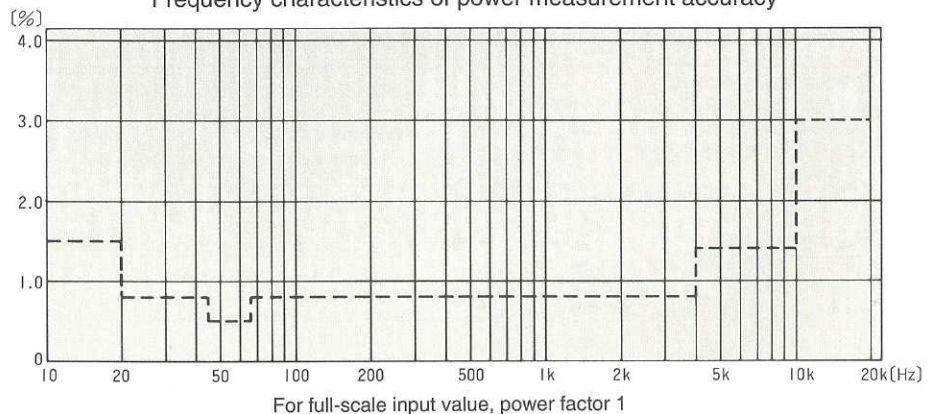
### GP-IB based system integration

By fitting the optional GP-IB interface, the unit can be used in an integrated, computer-controlled system. At an economical price, this makes possible systems which would have been impossible with analog instruments.

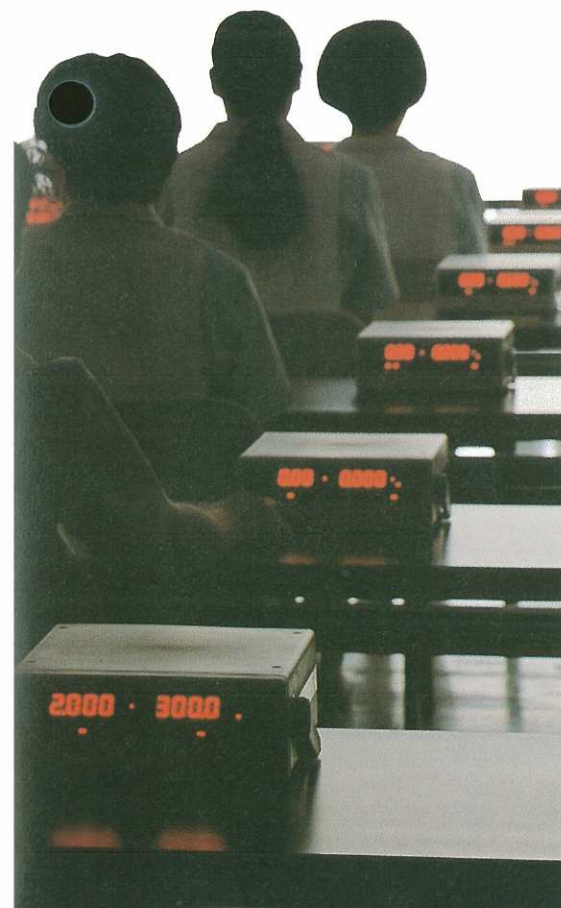
### Analog measurement outputs for recording

There are three simultaneous DC voltage analog outputs for voltage, current and power. This allows permanent recording, or monitoring with a meter relay.

Frequency characteristics of power measurement accuracy



The product depicted in the photograph is equipped with the optional GP-IB interface.





## Basic specification

Line measured: single phase, two conductor (1  $\phi$  2W)

Values measured: voltage, current, effective power, and apparent power

Measurement methods:

Voltage: potential transformer insulated input, displaying real effective value(RMS)

Current: current transformer insulated input, displaying real effective value(RMS)

Effective power: analog multiplier circuit

Apparent power: digital computation

Measurement ranges:

Voltage (manual/auto range setting)

Current (manual/auto range setting)

Effective power and apparent power ranges (auto range setting only)

See separate table of ranges. For all measurements, the effective display range is from 10% to 102% of the set range.

\* Zero override: when the input value is below 0.4% of the set measurement range, it is overridden and the displayed value is set to zero.

\* Auto ranging switches the range up when the input signal exceeds 102% of the currently set range, or when the excess input warning lamp lights.

\* Auto ranging switches the range down when the input signal drops below 30% of the currently set range.

Input resistances: voltage-about 1 M $\Omega$ ; current - about 2 m $\Omega$ .

Measurement frequency range: 10 Hz to 20 kHz

Maximum sustainable inputs: voltage - 866 V peak; current - 45 A peak

Maximum common mode voltage: 600 VAC rms (50/60 Hz)

Analog outputs: Output voltage - 2 V DC f.s.

Accuracy is the same as the measurement accuracy (load resistance minimum 2 k $\Omega$ ).

Response time is the same as the measurement response.

\* Three analog outputs provide simultaneous voltage, current and effective power values.

Backup function: preserves internal settings when unit is powered off.

## Display functions

Displays: two LED displays, each full 4 digits

Display refresh rate: 5 times per second to once per twenty seconds (depending upon the averaging function)

Response time: Analog output, about 1.4 seconds

\* Time for display to be within accuracy limit after sudden change from 0% to 90%, or from 100% to 10%, of the range

Display scaling factors:

Voltage: PT ratio (off, and 2 to 1400 in 13 steps)

Current: CT ratio (off, and 2 to 2000 in 37 steps)

Display averaging function: displays computed averages

Averaging sample count (off, and 2 to 100 in 6 steps)

Warning indications:

Excess input if peak value more than three times range value

Out-of-range and scaling error indications

## Accuracy specification

Ranges

	200.0mA	500.0mA	1.000A	2.000A	5.000A	10.00A	20.00A
150.0V	30.00W	75.00W	150.0W	300.0W	750.0W	1.500kW	3.000kW
300.0V	60.00W	150.0W	300.0W	600.0W	1.500kW	3.000kW	6.000kW
600.0V	120.0W	300.0W	600.0W	1.200kW	3.000kW	6.000kW	12.00kW

\* The apparent power ranges are the same as the effective power range, in VA in place of W.

Accuracy (at 23 $^{\circ}$ C  $\pm$  5 $^{\circ}$ C, power factor 1, warm-up time at least 30 minutes)

Frequency	Voltage/current/effective power	Apparent power
10 Hz - 20 Hz	$\pm$ 1.5% f.s.	Voltage tolerance + current tolerance + calculation precision ( $\pm$ 0.05% f.s.)
20 Hz - 45 Hz	$\pm$ 0.4% rdg. $\pm$ 0.4% f.s.	
45 Hz - 66 Hz	$\pm$ 0.4% rdg. $\pm$ 0.1% f.s.	
66 Hz - 4kHz	$\pm$ 0.4% rdg. $\pm$ 0.4% f.s.	
4kHz - 10kHz	$\pm$ 1.4% f.s.	
10kHz - 20kHz	$\pm$ 3.0% f.s.	

Crest factor: voltage, current and power, 3 or less

Temperature coefficient: less than  $\pm$  0.05% f.s./ $^{\circ}$ C

Power factor influence:  $\pm$  0.4% rdg. (at 45 to 66 Hz and a power factor of 0.5)

External magnetic field influence:  $\pm$  1.5% f.s.

\* in a magnetic field of AC 400 A/m, 50/60 Hz

Influence of common mode voltage: less than  $\pm$  0.05% f.s.

\* with input terminals short-circuited, and 600 V AC, 50/60 Hz, applied between the input terminals and the frame

## Option

9517 GP-IB interface

Electrical and physical standards:

Complies with: IEEE 488.1-1987

With reference to: IEEE 488.2-1987

Interface functions: SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0, E2

Codes used: ASCII

## General specification

Operation temperature / humidity ranges:

0 $^{\circ}$ C to 40 $^{\circ}$ C, less than 80% relative humidity (with no condensation)

Storage temperature / humidity ranges:

-10 $^{\circ}$ C to 50 $^{\circ}$ C, less than 80% relative humidity (with no condensation)

Insulation resistance: at 500 VDC, at least 100 M $\Omega$  (between the input terminals and the frame and other metal terminals, and between metal parts and the power supply)

Withstand voltage: 2.2 kV AC, 1 minute (between the input terminals and the frame and other metal terminals)

1.5 kV AC, 1 minute (between metal parts and the power supply)

Power supply: 100 VAC, 120 VAC, 220 VAC, or 240 VAC  $\pm$  10% (max. 250 VAC), 50/60 Hz (specified at time of order)

Power consumption: 13 VA (including the 9517 GP-IB interface)

Dimensions / mass: Approx. 215W  $\times$  80H  $\times$  280Dmm / Approx. 2.8 kg

Accessories: power cord 1, spare fuse 1

## Ordering information

3186 DIGITAL POWER HITESTER

Options

9517 GP-IB INTERFACE

\* The GP-IB interface is designed for easy customer installation, and is shipped in a separate package even if ordered together with the 3186 unit.

9151-02 GP-IB cable(2m)

9151-04 GP-IB cable(4m)

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