High Accuracy Power Analysis.
Anywhere, Anytime.
High Accuracy and Mobility.  
A New Value for Power Analysis.

The original HIOKI POWER ANALYZER 3390, released 8 years ago, featured the latest measurement technology built into a compact casing.

Pair with Hioki current sensors and take them anywhere to immediately make highly accurate measurements.

This was the unique value of the 3390.

Now, Hioki has enhanced this value while refining the measurement technology even further.

Proper accuracy and bandwidth to precisely measure inverter output.  
Phase shift function for the exact measurement of high frequency, low power factor power.  
A broad current sensor lineup that expands the range of measurement possibilities.

Refinements that empower you to conduct precise power analysis in any situation.
Complete Pursuit of Measurement Accuracy and High Frequency Characteristics

The PW3390 delivers 4 input channels and ±0.04% basic accuracy for power - the top instrument in its class. Achieve more precise measurements of the power and efficiency of high efficiency equipment used in power electronics. Further, a 200 kHz measurement band and flat amplitude and phase characteristics up to high frequencies enable the precise measurement of power at top frequency levels and low power factor.

Power Analysis Engine That Achieves High-Speed Simultaneous Calculation on 5 Systems

Precisely capture input waveforms with 600 kS/s high-speed sampling and a high resolution 16-bit A/D converter. The power analysis engine performs independent digital processing for 5 systems: period detection, wideband power analysis, harmonic analysis, waveform analysis, and noise analysis. High-speed simultaneous calculation processing enables both precise measurements and a 50 ms data refresh rate.


High Accuracy Sensor Pass-Through Type
Pass-through type with high accuracy and a wide measurement range. Conduct extremely accurate measurements of large currents to a maximum of 1000 A over a wide operating temperature range.

High Accuracy Sensor Clamp Type
Clamp for quick and easy connections. Conduct extremely accurate measurements of large currents to a maximum of 1000 A over a wide operating temperature range.

High Accuracy Sensor Direct Wire Type
Newly developed DCCT method delivers expansive measurement range and superior measurement accuracy at a rating of 50 A.

Built-in Current Sensor Phase Shift Function
Equipped with new virtual oversampling technology. Achieve phase shift equivalent to 200 MS/s while maintaining a high speed of 500 kS/s, as well as a high resolution of 16 bits. Set and correct the phase error of the current sensor at a resolution of 0.01°. Use of the phase shift function results in a dramatic reduction of measurement error. This allows the measurement of high-frequency, low-power factor power included in the switching frequency of inverter output, which is difficult to measure with conventional equipment.
In the Laboratory or in the Field

Take Highly Accurate Measurements Even in Tough Temperature Conditions
Severe temperature environments, such as engine rooms with intense temperature changes and constant temperature rooms, can hinder high accuracy measurements. The extremely accurate pass-through and clamp type sensors both feature excellent temperature characteristics and a wide operation temperature range to help address these challenges.

Max. 6000 A Measurement on 50 Hz/60 Hz Lines
The CT7040 AC FLEXIBLE CURRENT SENSOR series can measure commercial power lines up to 6000 A, including solar power conditioner output. Even thick cables can be wired easily among crowded wiring or in narrow locations.

New Method for Measuring Large Current over Multi-Cable Wiring
Highly accurate measurement of current in multi-cable wiring with large currents has been difficult until now. The CT9557 adds the output waveforms from the high accuracy sensors connected to each branch line of the multi-cable wiring, for the highly accurate measurement of large currents.

Achieve High Accuracy Measurement Even in the Field
Dramatically compact and light-weight form factor achieved by concentrating the calculation functions in the power analysis engine. Highly accurate measurements normally achieved in the laboratory are now also possible in the field.

External Power Supply Not Needed for Sensor Connections
Power can be supplied to the current sensor from the main unit, so there is no need to provide a separate external power supply for the current sensor. Connected sensors are recognized automatically, for reliable and quick measurements.

Wiring Displays and Quick Setup Lets You Begin Measuring Immediately
Perform wiring while checking wiring diagrams and vectors on the screen. Optimum settings are performed automatically simply by selecting a connection and using the quick setup function.

Extensive Interface for Linking with External Devices
Wide variety of built-in interfaces, including LAN, USB (communication, memory), CF cards, RS-232C, synchronization control, and external control. D/A output* delivers analog output at 50 ms for up to 16 parameters. The voltage and current waveform** for each channel can also be output.

* Built-in for PW3390-02 and PW3390-03
** During waveform output, accurate reproduction is possible at an output of 500 kS/s and with a sine wave up to 20 kHz.
Switch Screens with a Single Touch, Accessing a Variety of Power Analysis Methods

The power analysis engine allows the simultaneous, parallel calculation of all parameters. Access a variety of analysis methods simply by pressing the page keys to switch screens.

**Vector**

Confirm the voltage/current/power/phase angle for each harmonic order on a vector graph and as numerical values.

**Waveform**

Display voltage/current waveforms for 4 channels at a high speed of 500 kS/s or a maximum length of 5 seconds. Waveform data can be saved.

**Harmonics Graph**

Display harmonics up to the 100th order for voltage/current/power in bar graphs. Confirm the numerical data for the selected order at the same time.

**Efficiency and Loss**

Using active power values and motor power values, confirm efficiency η [%] and loss [W] and total efficiency for each inverter/motor on a single unit at the same time.

**Selection Display**

Select 4/8/16/32 display parameters individually for each screen, and summarize them on a single screen.

**Noise**

Display FFT results for voltage and current as graphs and numerical values, up to a maximum of 100 kHz. This is perfect for the frequency analysis of inverter noise.

**Power**

On the basic measurement screen, display voltage/current/power/power factor/frequency and other parameters in a list for each connection.

**X-Y Graph**

Create inverter characteristic evaluations and motor torque maps. Select the desired parameter to display an X-Y plot graph.
Applications

Measure the Power Conversion Efficiency of Inverters

Power supply
Inverter
Motor

Inverter I/O measurement
(Input: Channels 1 and 2, Output: Channels 3 and 4)
Voltage, current, power, power factor, electric energy, noise measurement, frequency, inverter loss and efficiency, harmonic analysis

Combined accuracy throughout the entire range is provided through the use of a built-to-order high accuracy pass-through type current sensor. Obtain highly accurate measurements regardless of range, from large to minute currents, even for loads that fluctuate greatly.

Highly Accurate and Fast 50 ms Calculation of Power in Transient State
Measure power transient states, including motor operations such as starting and accelerating, at 50 ms refresh rates. Automatically measure and keep up with power with fluctuating frequencies, from a minimum of 0.5 Hz.

Detect cycles and calculate power
Data refreshed at 50 ms intervals
Automatic detection of fundamental wave even if the frequency fluctuates, from low to high frequencies

Combined Accuracy of Current Sensors Applicable throughout Entire Range
Combined accuracy throughout the entire range is provided through the use of a built-to-order high accuracy pass-through type current sensor. Obtain highly accurate measurements regardless of range, from large to minute currents, even for loads that fluctuate greatly.

Measure High-Frequency Noise in Inverters
Power supply problems caused by high switching inverter frequencies are unrelated to the fundamental frequency, making it difficult to conduct proper harmonic analysis. The noise analysis function performs a frequency analysis of noise components up to 100 kHz, and displays the frequency, and voltage and current levels for the top 10 points. This is effective for measuring high-frequency noise in inverters.

Acquire Data from up to 8 Synchronized Units (32 Channels)
When you connect CONNECTION CABLE 9683 to multiple PW3390 units, the control signals and internal clocks synchronize. From the master unit, you can control the measurement timing on the PW3390 units that are set as slaves. With interval measurement, you can save synchronized measurement data to a CF card or a PC to achieve simultaneous measurements across a larger number of systems.
Analyze and Measure EV/HEV Inverter Motors

Key features
1. Easy wiring and highly accurate measurements with the use of a pass-through type current sensor
2. Simultaneous measurement of all important parameters for secondary analysis of inverters, such as RMS value, MEAN value, and fundamental components
3. 0.5 Hz to 5 kHz harmonic analysis without external clock
4. Total measurement of inverter motors with built-in motor analysis function
5. Measurement of the voltage, torque, rotation rate, frequency, slip, and motor power required for motor analysis with a single unit
6. More precise measurements of electrical angle with incremental type encoders

Electric Angle Measurement of Motors

The PW3390-03 features a built-in electric angle measurement function required for vector control via dq coordinate systems in high-efficiency synchronized motors. Make real-time measurements of phase angles for voltage and current fundamental wave components based on encoder pulses. Further, zero-adjustment of the phase angle when induced voltage occurs allows electric angle measurement based on the inductive voltage phase. Electric angle can also be used as an Ld and Lq calculation parameter for synchronized motors.

Display motor electric angles on the vector screen

Motor analysis screen (Torque, rotation rate, motor power, slip)
For CH B, enter the Z-phase pulse of the encoder to measure electric angle, and enter the B-phase pulse to measure rotation direction.

Measure Harmonics with Consideration for PWM Waveform Characteristics

The zero-crossing filter automatically matches the input frequency in the range of 0.5 Hz to 5 kHz to reliably detect the fundamental frequency. Further, harmonic analysis that is based on the fundamental frequency automatically prevents aliasing error using a digital AAF, which allows both precision and measurement reproducibility at a high level.

Transfer to Data Logger via Bluetooth® wireless technology

Connect the PW3390 and a data logger (with support of LR8410 Link) via Bluetooth® wireless technology to wirelessly transmit 8 parameters of measurement values from the PW3390 to the data logger. In addition to the voltage, temperature, humidity, and other parameters measured by the multichannel data logger, you can also integrate the measurement values of the PW3390 and observe and record them in real time.

No deterioration in accuracy, because of direct transmission
No connection required

* Connection requires the serial - (Bluetooth® wireless technology) conversion adapter and power supply adapter recommended by Hioki. Please inquire with your Hioki distributor.
Measure the Efficiency of PV Power Conditioners (PCS)

HIOKI’s Current Measurement Solutions for Large Currents of 1000 A or More

Introducing a lineup of sensors taking measurements up to 6000 A for 50 Hz/60 Hz, and up to 2000 A for direct current. The CT9557 SENSOR UNIT lets you add the output waveforms from multiple high accuracy sensors. Use multi-cable wiring lines to take highly accurate measurements of up to 4000 A.

Support for PCS Parameters

Simultaneously display the parameters required for PCS, such as efficiency, loss, DC ripple factor, and 3-phase unbalance rate. Easily check the required measured items for improved test efficiency. By matching the measurement synchronization source for both input and output, you can perform DC power measurements that are synchronized with the output AC as well as stable efficiency measurements.

Key features

1. 4 built-in channels, standard. Simultaneously measure the I/O characteristics of power conditioners.
2. Current sensors can measure even large currents with high accuracy. Reliable confirmation of wiring with vector diagrams.
3. Measure the amount of power sold/purchased from power conditioner output on interconnected systems with a single unit.
4. DC mode integration function, which responds quickly to input fluctuations such as with solar power, built in.
5. Measure ripple factor, efficiency, loss, and all other parameters that are required for the measurement of power conditioners for solar power with a single unit.

±0.01 Hz’ Basic Accuracy for Voltage Frequency Measurements

Perform the frequency measurements that are required for various PCS tests with industry-leading accuracy and stability. Take highly accurate frequency measurements on up to 4 channels simultaneously, while also measuring other parameters at the same time.
Test Automobile Fuel Economy

Evaluate WLTP Mode Performance - A New Fuel Economy Standard

Taking fuel economy measurements that comply with WLTP standards requires the precise measurement of current integration and power integration for the recharging/discharging of each battery in the system. High accuracy clamp current sensors, the excellent DC accuracy of the PW3390, and the ability to integrate current and power at 50 ms intervals are extremely effective in meeting this application.

Optimal Current Sensors for Automotive Testing

Easily connect high accuracy clamp-type sensors without cutting the cables. Sensors operate over a temperature range of -40°C to 85°C (-40°F to 185°F), characteristics that enable highly accurate measurements even inside the engine room of a car.

Current and Power Integration Function by Polarity

DC integration measurement integrates the recharging power and discharging power by polarity for every sample at 500 kS/s, and measures positive-direction power magnitude, negative-direction power magnitude, and the sum of positive- and negative-direction power magnitude during the integration period. Accurate measurement of recharging power and discharging power is possible even if there is rapid repetition of battery recharging/discharging.

Link to Peripheral Devices via External Control

Use external control terminals to START/STOP integration and capture screen shots. This makes it easy to control operations from console switches and link to the timing of other instruments when measuring the performance of an actual automobile.
Download software, drive rs, and the Communications Command Instruction Manual from the Hioki website. https://www.hioki.com

"PW Communicator" PC Communication Software (Available soon)

PW Communicator is an application program for communicating between a PW3390 series power analyzer and a PC. It includes many useful functions, such as configuring PW3390 settings, monitoring measurement values, saving CSV data, and calculating efficiency.

Numerical value monitoring: Display the PW3390’s measurement values on the PC screen. You can freely select up to 32 values, such as voltage, current, power, and harmonics.

Waveform monitoring: Monitor the measured voltage, current, and waveforms on the PC screen.

Motor setting: Change the settings of the connected PW3390 from the PC screen.

Measure with multiple units: In addition to the PW3390, it is also possible to perform batch control of up to 8 devices from the Hioki PW6001 Power Analyzer and the PW3335, PW3336, and PW3337 Power Meter series. You can also simultaneously record measured data to the PC, and perform efficiency calculations for measuring instruments.

Record in CSV format: Record measured data to a CSV file at regular time intervals. The minimum recording interval is 50 ms.

Operating environment:

<table>
<thead>
<tr>
<th>Operating environment</th>
<th>PC/AT-compatible computer</th>
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<tbody>
<tr>
<td></td>
<td>Windows 10</td>
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<td>Windows 8</td>
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<td>Windows 7 (32bit/64bit)</td>
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* Windows is a registered trademark of Microsoft Corporation in the United States and/or other countries.

Memory: 2 GB or more recommended

Interface: LAN/RS-232C/USB

LabVIEW Driver (Available soon)

Obtain data and configure measurement systems with the LabVIEW driver.

* LabVIEW is a registered trademark of NATIONAL INSTRUMENTS.
### Specifications

#### Basic Specifications

**Measurement line type**
- Single-phase 2-wire (1P2W), Single-phase 3-wire (1P3W)
- 3-phase 3-wire (3P3W), 3-phase 4-wire (3P4W)

**Input terminals**
- CH1, CH2, CH3, CH4
- Pattern 1: 1P2W, 1P2W, 1P2W, 1P2W
- Pattern 2: 1P2W, 1P2W, 1P2W, 1P2W
- Pattern 3: 3P3W, 1P3W, 1P3W, 1P3W
- Pattern 4: 1P3W
- Pattern 5: 3P3W, 3P3W, 3P3W
- Pattern 6: 3P3W, 3P3W, 3P3W

**Input signals**
- Voltage range: 15 V (0.00 V to 15.00 V, 0.0000 Hz to 999.99 Hz)
- Current range: 0.1 A (0.001 A to 0.100 A, 0.0000 Hz to 50.00 Hz)

**Input sensitivities**
- Voltage input section: 1000 V (50 Hz/60 Hz)
- Current input section: 1 A/2 A/5 A/10 A/20 A/50 A (50 Hz/60 Hz)

**Accuracy**
- Volts: ±0.5% RDG. ±0.1% FS
- Amps: ±0.5% RDG. ±0.1% FS
- Watts: ±0.5% RDG. ±0.1% FS
- Var: ±0.5% RDG. ±0.1% FS

**Input filters**
- LPF: OFF, 500 Hz, 5 kHz, 100 kHz

**Voltage range**
- Maximum input voltage:
  - Voltage input section: 1500 V, ±2000 V peak
  - Current input section: 5 V, ±10 V peak

**Application**
- For voltage and current values to use for calculating apparent and reactive power, and power factor
- Simultaneous digital sampling of voltage and current, simultaneous frequency range
- Simultaneous digital sampling of voltage and current, simultaneous zero-crossing calculation method

**Number of input channels**
- 4 channels

**Input types**
- Voltage: Ph+g, ph (single phase)
- Current: Customized: dedicated current input (MAT15W)

**Frequency Measurement Specifications**

**Input signals**
- Voltage range: 0.000 Hz to 999.99 Hz
- Current range: 0.001 A to 100 A

**Accuracy**
- Voltage: ±0.5% RDG. ±0.1% FS
- Current: ±0.5% RDG. ±0.1% FS

**Power Measurement Input Specifications**

**Input signals**
- Voltage range: 0.000 V to 15.00 V
- Current range: 0.001 A to 50.00 A

**Accuracy**
- Voltage: ±0.5% RDG. ±0.1% FS
- Current: ±0.5% RDG. ±0.1% FS

**Frequency Measurement Specifications**

**Input signals**
- Voltage range: 0.000 Hz to 999.99 Hz
- Current range: 0.001 A to 100 A

**Accuracy**
- Voltage: ±0.5% RDG. ±0.1% FS
- Current: ±0.5% RDG. ±0.1% FS
-3. Integration Measurement Specifications

Measurement mode
- Selectable between RMS or DC for each wiring mode

Measurement items
- Current integration (Ih, Ih, and Ih), active power integration (PW+, PW-, and PW)
- for both direct and alternating current measurement, and it is only for RMS mode measurements

Measurement method
- Digital calculation from each current and active power value when averaging, which calculates with previous average value.
- In DC mode, calculate current at each sample, and integrates instantaneous power independent of polarity
- In AC mode, integrate current effective values between measurement intervals, and polarity-independent active power value

Measurement interval
- 50 ms data update interval

Measurement range
- Integration value: ±9999.99 THA/THWh
- Integration time: No greater than 9999h99m

Integration time accuracy
- ±0.05% rdg. ±0.05% f.s.
- ±0.03% f.s./°C

Integration accuracy
- ±0.5% F.S. for DC, ±1.0% F.S. for AC

Backup function
- Integration automatically resumes after power outages.

Measurement mode
- Selectable between RMS or DC for each wiring method

- Frequency source
- Windows

- Terminal type
- Measurement input
- Measurement method
- Simultaneous digital sampling and zero-crossing synchronous calculation system. (Cumulative average of intervals between zero crossings)

- Response time 1 ms (measuring zero to full scale)
- 1 MΩ ±100 kΩ
- Input impedance (DC)
- ±0.05% rdg. ±0.05% f.s.

- Measurement range
- ±500 A
- ±500 A
- ±500 A
- ±5 kHz
- ±1 kHz
- ±2 kHz
- ±2.5 kHz
- ±2.5 kHz

- Data update interval
- 50 ms (measurement-frequency-dependent at 45 Hz and below)

- Setting
- Phased zero adjustment
- Provided by key operation or external control command (only with external sync source)

- Accuracy
- Voltage: ±0.05% rdg. ±0.05% f.s.
- Current: ±0.05% rdg. ±0.05% f.s.
- Power: ±0.5% F.S. ±1.0% F.S.
- Power factor: ±0.1% (at 400 A/m DC and 50 Hz/60 Hz magnetic field)
- Voltage unbalance factor, current unbalance factor
- Total harmonic voltage distortion, total harmonic current distortion

- Number of measurement channels
- 8 channels

- Harmonic Measurement Specifications

- Measurement items
- Harmonic rms voltage, harmonic voltage percentage, harmonic voltage phase angle, harmonic current percentage, harmonic current phase angle, harmonic active power, harmonic power percentage, harmonic voltage-current phase difference, total harmonic voltage distortion, total harmonic current, harmonic voltage unbalance factor, current unbalance factor

- Measurement method
- Zero-crossing synchronous calculation (all channels in same window), with gap
- Fixed 500 kHz sampling rate
- Digital anti-aliasing filter
- Rectangular or Trapezoidal

- Synchro
- Frequency range
- 0 Hz ≤ f ≤ 50 Hz
- 50 Hz ≤ f ≤ 1 kHz
- 1 kHz ≤ f ≤ 10 kHz
- 10 kHz ≤ f ≤ 100 kHz
- 100 kHz ≤ f ≤ 1 MHz

- Accuracy
- Voltage: ±0.05% rdg. ±0.05% f.s.
- Current: ±0.05% rdg. ±0.05% f.s.
- Power: ±0.5% F.S. ±1.0% F.S.
- Power factor: ±0.1% (at 400 A/m DC and 50 Hz/60 Hz magnetic field)

- Number of measurement channels
- 16 channels

- Harmonic measurement
- Measurement time
- No greater than 9999h59m

- Integration range
- ±9999.99 THA/THWh

- Loop

- Display Specifications

- Display type
- 8-inch TFT color LCD (800x480) dot

- Display refresh interval
- Measurement value: 200 ms (under measurement of internal data update interval), Waveform: FFT, screen-dependent

- External Interface Specifications

- (1) USB Interface (Functions)

- Connector
- Micro B receptacle x 1

- Compliance standard
- USB2.0 (Full Speed/High Speed)

- Connection destination
- Computer (Windows/Windows7, 32bit/64bit)

- Function
- Data transfer and control command

- (2) USB Memory Interface

- Connector
- USB type A connector x 1

- Compliance standard
- USB2.0

- USB power supply
- 500 mA maximum

- USB storage device support
- USB Mass Storage Class

- Function
- Save and load settings files, save waveform data, save displayed measurements (CSV format), Copy measurement values and recorded data (from CF card)

- Save screen captures

- (3) LAN Interface

- Connector
- RJ-45 connector x 1

- Compliance standard
- IEEE 802.3 compliant

- Transmission method
- BASE-T/100BASE-TX Automatic detection

- Protocol
- TCP/IP

- Function
- HTTP server (remote operation), Dedicated port (data transfer and control command)
Function Specifications

1. Control Functions

- **Auto range function**
  - Automatically selects voltage and current ranges according to measured amplitude on each phase.

- **Display selections**
  - Wiring check screen: The wiring diagram and voltage/current vectors are displayed for the selected wiring system.
  - Average calculation: OFF/PT/VT ratio and CT ratio: OFF/0.01 to OFF/FAST/MID
  - Compensation by calculating the current sensor’s harmonic phase characteristics. Compensation points are set using frequency and phase differences (set separately for each wiring mode).

- **Display Functions**
  - The wiring diagram and voltage/current vectors are displayed for the selected wiring system.
  - The correct range for the wiring system is shown on the vector display, to confirm proper measurement cable connections.

2. Calculation functions

- **Scaling calculation**
  - FT/FT (ratio): FT/FT (ratio) = FT/0.01 to FT/0.99

- **Average calculation**
  - Exponentially averages all instantaneous measurement values including harmonics (but not true instantaneous FFT root mean square values). Applied to measured values and saved data.

- **Efficiency and loss calculations**
  - Efficiency η = 100 × (Pinout/Pin)

3. True-rms calculation

- **For 3P3W system**
  - Select the calculation method used to calculate the apparent power and reactive power during 3P3W system measurement.

4. Display specifications

- **Screen**
  - Save and load settings, waveform data, saved measurement data and auto-recorded data (CSV format)
  - Copy measurements/recorded data (from USB storage)

5. Connectivity

- **Hardware flow control, CR+LF delimiter**
  - Data format: CSV format

- **Copy measurement/recorded data (from USB storage)**
  - Data format: CSV format

- **Wireless communication using Bluetooth®**
  - Send data: Saves the waveform being displayed by means of (Waveform) display.
  - Data format: CSV format

- **Measurement cable connectivity**
  - Sends measured values wirelessly by using a Bluetooth® serial conversion adapter.

- **USB cable**
  - Real-time clock function: Auto-calender, leap-year correcting life-clock function

6. Synchronization functions

- **Synchronization measurement**
  - Synchronization measurement values are available by using sync cables to connect Model PW3900 (maskless).
  - When internal settings match, auto-save is available while synchronized.

- **Display data reset**
  -Saves the waveform being displayed by means of (Waveform) display.

- **Auto-save**
  - As the items to be saved, select any measured values including harmonics and noise value data of the FFT function. The selected items are stored to CF card during every measurement interval. (Storage to USB memory is not available.)

- **Manual saving function**
  - Select to display any 4, 8, 16, or 32 of the basic measurement parameters.

- **Data format**
  - File format: SET format (for PW3900 only)
  - Waveform display available)

7. Other Functions

- **Display language selection**
  - Japanese, English, Chinese

- **Set-up screen selection**
  - Writing or Last-displayed screen (Measurement screens only)

- **Display Backlight**
  - ON/OFF

- **Input cord label**
  - ×2, D-sub connector ×1

- **Settings information**
  - Can be controlled by timer or real-time clock.

- **System reset**
  - Returns all settings including language and communications settings, to factory default.

- **File operation**
  - Media content list display, format media, create folders, delete files and folders, copy between storage media

General Specifications

- **Operating environment**
  - Indoor, Pollution degree 2, altitude up to 2000 m (6562.20 ft)

- **Operating temperature and humidity**
  - Temperature: 0°C to 40°C (32°F to 104°F), Humidity: 80% RH or less

- **Storage temperature and humidity**
  - 10°C to 55°C (14°F to 122°F), 85% RH or less (no condensation)

- **Weight and package**
  - 3.0 kg (6.6 lb) with PW3900-03

- **Product warranty period**
  - 1 year

- **Accessories**
  - Instruction Manual x1, Measurement Guide x1, Power cord x1, USB cable (0.9 m or 3.0 ft) x1, input cord label x2, D-sub connector x1 (PW3900-02, PW3900-03)
**High Accuracy Sensor, Pass-Through Type**

### AC/DC CURRENT SENSOR

- **CT8662-05**
  - AC/DC Current: 50 A rms
  - Frequency Band: DC to 1 kHz
  - Diameter of Measurable Conductors: 24 mm (0.94 in) or less
  - Basic Accuracy: ±0.1% rdg. ±0.02% f.s.
  - Effects of External Characteristics:
    - Operating Temperature Range: -40°C to 85°C (-40°F to 185°F)
    - Effects of Conductor Position: ±0.01% rdg. or less (DC to 100 Hz)
  - Mass: Approx. 540 g (12.3 oz)

- **CT8683-05**
  - AC/DC Current: 200 A rms
  - Frequency Band: DC to 500 kHz
  - Diameter of Measurable Conductors: 24 mm (0.94 in) or less
  - Basic Accuracy: ±0.1% rdg. ±0.02% f.s.
  - Effects of External Characteristics:
    - Operating Temperature Range: -30°C to 85°C (-22°F to 185°F)
    - Effects of Conductor Position: ±0.01% rdg. or less (DC to 100 Hz)
  - Mass: Approx. 990 g (2.2 lbs)

- **CT8708-05**
  - AC/DC Current: 500 A rms
  - Frequency Band: DC to 1 kHz
  - Diameter of Measurable Conductors: 24 mm (0.94 in) or less
  - Basic Accuracy: ±0.1% rdg. ±0.02% f.s.
  - Effects of External Characteristics:
    - Operating Temperature Range: -40°C to 85°C (-40°F to 185°F)
    - Effects of Conductor Position: ±0.01% rdg. or less (DC to 100 Hz)
  - Mass: Approx. 3770 g (8.3 lbs)

- **CT8685-05**
  - AC/DC Current: 1000 A rms
  - Frequency Band: DC to 20 kHz
  - Diameter of Measurable Conductors: 24 mm (0.94 in) or less
  - Basic Accuracy: ±0.1% rdg. ±0.02% f.s.
  - Effects of External Characteristics:
    - Operating Temperature Range: -40°C to 85°C (-40°F to 185°F)
    - Effects of Conductor Position: ±0.01% rdg. or less (DC to 100 Hz)
  - Mass: Approx. 9900 g (21.8 lbs)

**High Accuracy Sensor, Clamp Type**

### AC/DC CURRENT PROBE

- **CT8641-05**
  - AC/DC Current: 20 A rms
  - Frequency Band: DC to 1 kHz
  - Diameter of Measurable Conductors: 20 mm (0.79 in) or less (insulated conductor)
  - Basic Accuracy: ±0.2% rdg. ±0.01% f.s.
  - Effects of External Characteristics:
    - Operating Temperature Range: -30°C to 85°C (-22°F to 185°F)
    - Effects of Conductor Position: ±0.2% rdg. or less (DC to 100 Hz)
  - Mass: Approx. 377 g (13.2 oz)

- **CT8643-05**
  - AC/DC Current: 200 A rms
  - Frequency Band: DC to 500 kHz
  - Diameter of Measurable Conductors: 20 mm (0.79 in) or less (insulated conductor)
  - Basic Accuracy: ±0.2% rdg. ±0.01% f.s.
  - Effects of External Characteristics:
    - Operating Temperature Range: -30°C to 85°C (-22°F to 185°F)
    - Effects of Conductor Position: ±0.2% rdg. or less (DC to 100 Hz)
  - Mass: Approx. 880 g (24.6 oz)

- **CT8644-05**
  - AC/DC Current: 500 A rms
  - Frequency Band: DC to 20 kHz
  - Diameter of Measurable Conductors: 20 mm (0.79 in) or less (insulated conductor)
  - Basic Accuracy: ±0.2% rdg. ±0.01% f.s.
  - Effects of External Characteristics:
    - Operating Temperature Range: -30°C to 85°C (-22°F to 185°F)
    - Effects of Conductor Position: ±0.2% rdg. or less (DC to 100 Hz)
  - Mass: Approx. 3770 g (8.3 lbs)

- **CT8645-05**
  - AC/DC Current: 1000 A rms
  - Frequency Band: DC to 500 Hz
  - Diameter of Measurable Conductors: 50 mm (1.97 in) or less (insulated conductor)
  - Basic Accuracy: ±0.2% rdg. ±0.01% f.s.
  - Effects of External Characteristics:
    - Operating Temperature Range: -30°C to 85°C (-22°F to 185°F)
    - Effects of Conductor Position: ±0.2% rdg. or less (DC to 100 Hz)
  - Mass: Approx. 9900 g (21.8 lbs)

### AC/DC CURRENT SENSOR

- **CT8701-05**
  - AC/DC Current: 350 g (12.3 oz)
  - Frequency Band: DC to 1 kHz
  - Diameter of Measurable Conductors: 24 mm (0.94 in) or less
  - Basic Accuracy: ±0.2% rdg. ±0.01% f.s.
  - Effects of External Characteristics:
    - Operating Temperature Range: -40°C to 85°C (-40°F to 185°F)
    - Effects of Conductor Position: ±0.01% rdg. or less (DC to 100 Hz)
  - Mass: Approx. 400 g (14.1 oz)

- **CT8702-05**
  - AC/DC Current: 370 g (13.1 oz)
  - Frequency Band: DC to 500 kHz
  - Diameter of Measurable Conductors: 24 mm (0.94 in) or less
  - Basic Accuracy: ±0.2% rdg. ±0.01% f.s.
  - Effects of External Characteristics:
    - Operating Temperature Range: -40°C to 85°C (-40°F to 185°F)
    - Effects of Conductor Position: ±0.01% rdg. or less (DC to 100 Hz)
  - Mass: Approx. 800 g (28.3 oz)

- **CT8703-05**
  - AC/DC Current: 400 g (14.1 oz)
  - Frequency Band: DC to 500 kHz
  - Diameter of Measurable Conductors: 24 mm (0.94 in) or less
  - Basic Accuracy: ±0.2% rdg. ±0.01% f.s.
  - Effects of External Characteristics:
    - Operating Temperature Range: -40°C to 85°C (-40°F to 185°F)
    - Effects of Conductor Position: ±0.01% rdg. or less (DC to 100 Hz)
  - Mass: Approx. 980 g (21.6 lbs)

### AC/DC CURRENT SENSOR

- **CT8707-05**
  - AC/DC Current: 500 g (17.7 oz)
  - Frequency Band: DC to 1 kHz
  - Diameter of Measurable Conductors: 24 mm (0.94 in) or less
  - Basic Accuracy: ±0.2% rdg. ±0.01% f.s.
  - Effects of External Characteristics:
    - Operating Temperature Range: -40°C to 85°C (-40°F to 185°F)
    - Effects of Conductor Position: ±0.01% rdg. or less (DC to 100 Hz)
  - Mass: Approx. 990 g (2.2 lbs)

**Custom cable lengths also available. Please inquire with your Hioki distributor.**
High Accuracy Sensor, Direct Wire Type

**AC/DC CURRENT BOX PW9100-03**
- **Rated primary current**: AC/DC 50 A rms
- **Frequency band**: DC to 3.5 kHz (-3 dB)
- **Dimensions**: 430 mm (16.93 in) W x 88 mm (3.46 in) H x 260 mm (10.24 in) D,
  4.3 kg (9.46 lb)
- **Input resistance**: ±0.2% or less (DC and 60 Hz)
- **Maximum rated voltage (Measurement category II)**: 600 V
- **Cable length**: 3 m (9.84 ft)
- **Mass**: 7 kg (130.5 oz)
- **External power supply**: 500 VA/HIOKI ME15W
- **Max. rated power**: 60 VA

**AC/DC CURRENT BOX PW9100-04**
- **Rated primary current**: AC/DC 50 A rms
- **Frequency band**: DC to 3.5 kHz (-3 dB)
- **Dimensions**: 238 mm (9.37 in) W x 116 mm (4.57 in) H x 67 mm (2.64 in) D
- **Mass**: 510 g (1.80 lb)
- **External power supply**: 300 VA/HIOKI ME15W
- **Max. rated power**: 60 VA

**AC/DC CURRENT BOX PW9100-05**
- **Rated primary current**: AC/DC 100 A rms
- **Frequency band**: DC to 3.5 kHz (-3 dB)
- **Dimensions**: 116 mm (4.57 in) W x 67 mm (2.64 in) H x 25 mm (0.98 in) D
- **Mass**: 4.3 kg (9.46 lb)
- **External power supply**: 500 VA/HIOKI ME15W
- **Max. rated power**: 60 VA

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**Standard Sensor**

**AC/DC CURRENT SENSOR CT9402**
- **Rated primary current**: AC/DC 200 A rms switching
- **Frequency band**: DC to 1 kHz (-3 dB)
- **Dimensions**: 78 mm (3.07 in) W x 188 mm (7.40 in) H x 35 mm (1.38 in) D
- **Mass**: 450 g (15.9 oz)
- **Effect of conductor temperature range and measurement accuracy at a rating of 50 A.**

**AC/DC CURRENT Sensor, Direct Wire Type**
- **Rated primary current**: AC/DC 50 A rms
- **Frequency band**: DC to 3.5 kHz (-3 dB)
- **Dimensions**: 430 mm (16.93 in) W x 88 mm (3.46 in) H x 260 mm (10.24 in) D,
  4.3 kg (9.46 lb)
- **Input resistance**: ±0.2% or less (DC and 60 Hz)
- **Maximum rated voltage (Measurement category II)**: 600 V
- **Cable length**: 3 m (9.84 ft)
- **Mass**: 7 kg (130.5 oz)
- **External power supply**: 500 VA/HIOKI ME15W
- **Max. rated power**: 60 VA

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**Current Summing**

**SIX DIGITAL MULTIMETER DM9000**
- **Rated primary current**: AC/DC 2000 A rms
- **Frequency band**: DC to 6 kHz
- **Dimensions**: 340 mm (13.4 in) W x 200 mm (7.9 in) H x 110 mm (4.33 in) D
- **Mass**: 7 kg (15.4 lbs)
- **External power supply**: 500 VA/HIOKI ME15W
- **Max. rated power**: 60 VA

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**CT99004 (sold separately)** is required to connect to PW9100.

*CT99004 (sold separately) is required to connect to PW9380.*

NEWLY DEVELOPED DCCT METHOD ALLOWS WORLD-CLASS MEASUREMENT RANGE AND MEASUREMENT ACCURACY AT A RATING OF 50 A.

**Wiring connection example 1 – Existing direct-input connection method**
For more reliable wideband high-accuracy measurements, use as an alternative to existing direct-input power meters.

**Wiring connection example 2 – Introducing a new and innovative measuring method**
Shorten the wiring for current measurement by installing the PW9100 close to the measurement target. This will also keep the effects of wiring resistance, capacity coupling and other objective factors on the measured values to a minimum.

---

**High Accuracy Sensor, Direct Wire Type**

**AC/DC CURRENT BOX PW9100-03**
- **Rated primary current**: AC/DC 50 A rms
- **Frequency band**: DC to 3.5 kHz (-3 dB)
- **Measurement terminals**: Terminal block (with safety cover), M6 screws
- **Basic accuracy**: To 45 Hz For DC: ±0.1% rdg. ±0.007% f.s.
  - To 1 kHz For DC: ±0.1% rdg. ±0.007% f.s.
- **Frequency characteristics**: To 1 kHz: ±0.05% rdg. ±0.02% f.s.
  - To 50 kHz: ±0.3% rdg. ±0.01% f.s.
- **Input resistance**: ±0.5 mΩ or less
- **Operating temperature range**: 0°C to 50°C
- **Effects of common-mode voltage (CMVR)**: 500/600 Hz: 100 dB or greater
  - <50 Hz: 100 dB or greater

**AC/DC CURRENT BOX PW9100-04**
- **Rated primary current**: AC/DC 50 A rms
- **Frequency band**: DC to 3.5 kHz (-3 dB)
- **Measurement terminals**: Terminal block (with safety cover), M6 screws
- **Basic accuracy**: To 45 Hz For DC: ±0.1% rdg. ±0.007% f.s.
  - To 1 kHz For DC: ±0.1% rdg. ±0.007% f.s.
- **Frequency characteristics**: To 1 kHz: ±0.05% rdg. ±0.02% f.s.
  - To 50 kHz: ±0.3% rdg. ±0.01% f.s.
- **Input resistance**: ±0.5 mΩ or less
- **Operating temperature range**: 0°C to 50°C

**AC/DC CURRENT BOX PW9100-05**
- **Rated primary current**: AC/DC 100 A rms
- **Frequency band**: DC to 3.5 kHz (-3 dB)
- **Measurement terminals**: Terminal block (with safety cover), M6 screws
- **Basic accuracy**: To 45 Hz For DC: ±0.1% rdg. ±0.007% f.s.
  - To 1 kHz For DC: ±0.1% rdg. ±0.007% f.s.
- **Frequency characteristics**: To 1 kHz: ±0.05% rdg. ±0.02% f.s.
  - To 50 kHz: ±0.3% rdg. ±0.01% f.s.
- **Input resistance**: ±0.5 mΩ or less
- **Operating temperature range**: 0°C to 50°C

---

**High Accuracy Sensor, Direct Wire Type**

**AC/DC CURRENT BOX PW9100-03**
- **Rated primary current**: AC/DC 50 A rms
- **Frequency band**: DC to 3.5 kHz (-3 dB)
- **Measurement terminals**: Terminal block (with safety cover), M6 screws
- **Basic accuracy**: To 45 Hz For DC: ±0.1% rdg. ±0.007% f.s.
  - To 1 kHz For DC: ±0.1% rdg. ±0.007% f.s.
- **Frequency characteristics**: To 1 kHz: ±0.05% rdg. ±0.02% f.s.
  - To 50 kHz: ±0.3% rdg. ±0.01% f.s.
- **Input resistance**: ±0.5 mΩ or less
- **Operating temperature range**: 0°C to 50°C

**AC/DC CURRENT BOX PW9100-04**
- **Rated primary current**: AC/DC 50 A rms
- **Frequency band**: DC to 3.5 kHz (-3 dB)
- **Measurement terminals**: Terminal block (with safety cover), M6 screws
- **Basic accuracy**: To 45 Hz For DC: ±0.1% rdg. ±0.007% f.s.
  - To 1 kHz For DC: ±0.1% rdg. ±0.007% f.s.
- **Frequency characteristics**: To 1 kHz: ±0.05% rdg. ±0.02% f.s.
  - To 50 kHz: ±0.3% rdg. ±0.01% f.s.
- **Input resistance**: ±0.5 mΩ or less
- **Operating temperature range**: 0°C to 50°C

**AC/DC CURRENT BOX PW9100-05**
- **Rated primary current**: AC/DC 100 A rms
- **Frequency band**: DC to 3.5 kHz (-3 dB)
- **Measurement terminals**: Terminal block (with safety cover), M6 screws
- **Basic accuracy**: To 45 Hz For DC: ±0.1% rdg. ±0.007% f.s.
  - To 1 kHz For DC: ±0.1% rdg. ±0.007% f.s.
- **Frequency characteristics**: To 1 kHz: ±0.05% rdg. ±0.02% f.s.
  - To 50 kHz: ±0.3% rdg. ±0.01% f.s.
- **Input resistance**: ±0.5 mΩ or less
- **Operating temperature range**: 0°C to 50°C
Model : POWER ANALYZER PW3390

<table>
<thead>
<tr>
<th>Model No. (Order Code)</th>
<th>D/A output</th>
<th>Motor analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>PW3390-01</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PW3390-02</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PW3390-03</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Accessories: Instruction Manual x1, Measurement Guide x1, Power cord x1, USB cable x1, Input cord label x2, D-sub 25-pin connector x1 (PW3390-02, PW3390-03)

- The optional voltage cord and current sensor are required for taking measurements.
- Motor analysis and D/A output cannot be changed or added after delivery.

Current Measurement Options

<table>
<thead>
<tr>
<th>Name (Note)</th>
<th>Model No. (Order Code)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC/DC CURRENT SENSOR (50 A)</td>
<td>CT6862-05</td>
</tr>
<tr>
<td>AC/DC CURRENT SENSOR (200 A)</td>
<td>CT6863-05</td>
</tr>
<tr>
<td>AC/DC CURRENT SENSOR (500 A)</td>
<td>9709-09</td>
</tr>
<tr>
<td>AC/DC CURRENT PROBE (20 A)</td>
<td>CT6845-05</td>
</tr>
<tr>
<td>AC/DC CURRENT PROBE (200 A)</td>
<td>CT6845-05</td>
</tr>
<tr>
<td>AC/DC CURRENT PROBE (500 A, φ 20 mm (0.79 in))</td>
<td>CT6845-05</td>
</tr>
<tr>
<td>AC/DC CURRENT PROBE (500 A, φ 50 mm (1.97 in))</td>
<td>CT6845-05</td>
</tr>
<tr>
<td>AC/DC CURRENT PROBE (1000 A)</td>
<td>CT6845-05</td>
</tr>
<tr>
<td>CLAMP ON SENSOR (AC 20 A/200 A)</td>
<td>9272-05</td>
</tr>
<tr>
<td>AC/DC CURRENT BOX (50 A, 3 ch)</td>
<td>PW9100-03</td>
</tr>
<tr>
<td>AC/DC CURRENT BOX (50 A, 4 ch)</td>
<td>PW9100-04</td>
</tr>
<tr>
<td>AC/DC AUTO ZERO CURRENT SENSOR (2000 A)</td>
<td>CT7742</td>
</tr>
<tr>
<td>AC/DC CURRENT SENSOR (6000 A, φ 100 mm (3.94 in))</td>
<td>CT7744</td>
</tr>
<tr>
<td>AC FLEXIBLE CURRENT SENSOR (2000 A, φ 180 mm (7.09 in))</td>
<td>CT7045</td>
</tr>
<tr>
<td>AC FLEXIBLE CURRENT SENSOR (6000 A, φ 254 mm (10.02 in))</td>
<td>CT7046</td>
</tr>
<tr>
<td>SENSOR UNIT (Sensor power supply with 4 channel summation function)</td>
<td>CT9557</td>
</tr>
</tbody>
</table>

* CONVERSION CABLE CT9920 is required to connect to PW3390.
** CONNECTION CABLE CT9904 is required to connect to PW3390.

Voltage Measurement Options

<table>
<thead>
<tr>
<th>VOLTAGE CORD L4385-50</th>
<th>Red, black: 1 each, 1000 V specification, Cord length: 3 m (9.84 ft) CAT IV 600 V, CAT III 1000 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLTAGE CORD L1000</td>
<td>Red, yellow, blue, gray: 1 each; Black: 4 1000 V specification, Cord length: 3 m (9.84 ft) CAT IV 600 V, CAT III 1000 V</td>
</tr>
<tr>
<td>WIRING ADAPTER PW9000</td>
<td>When making a 3-phase 3-wire (3P3W3G) connection, this product allows you to reduce the number of voltage cords from 6 to 3.</td>
</tr>
<tr>
<td>EXTENSION CABLE SET L4931</td>
<td>Red, black: 1 each, With connector, Cable length: 1.5 m (4.92 ft) For extension of L4385-50 or L1000 CAT IV 600 V, CAT III 1000 V</td>
</tr>
<tr>
<td>GRABBER CLIP 9243</td>
<td>Red, black: 1 each, Change the tip of the voltage cord to use CAT III 1000 V</td>
</tr>
<tr>
<td>WIRING ADAPTER PW9001</td>
<td>When making a 3-phase 4-wire (3P4W) connection, this product allows you to reduce the number of voltage cords from 6 to 4.</td>
</tr>
</tbody>
</table>

Please contact your Hioki distributor or subsidiary for more information.

Other Options

PC CARD 512 MB 9728
PC CARD 1 GB 9729
PC CARD 2 GB 9830

Use only PC Cards sold by HIOKI. Compatibility and performance are not guaranteed for PC cards made by other manufacturers. You may be unable to read from or save data to such cards.

CARRYING CASE 9794
Carrying Case for PW3390 and 3390 448 mm (17.64 in) W x 618 mm (24.33 in) H x 295 mm (11.61 in) D

Built-To-Order (Other)

D/A output cable
For EIA or JIS

Built-To-Order (Current Measurement)

PW9100-05 high-accuracy model
PW9100-03 high-accuracy model
AC/DC 2000 A high accuracy sensor, pass-through type

Built-To-Order (Other Options)

PC CARD 512 MB 9728—PW9100-05 high-accuracy model—PW9100-03 high-accuracy model—AC/DC 2000 A high accuracy sensor, pass-through type

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