

PQ3198 POWER QUALITY ANALYZER Measurement Guide

Mar. 2019 Edition1
PQ3198A981-00 19-03H



Thank you for purchasing the Hioki PQ3198 Power Quality Analyzer.

This guide introduces the basic measurement procedure to first-time users.

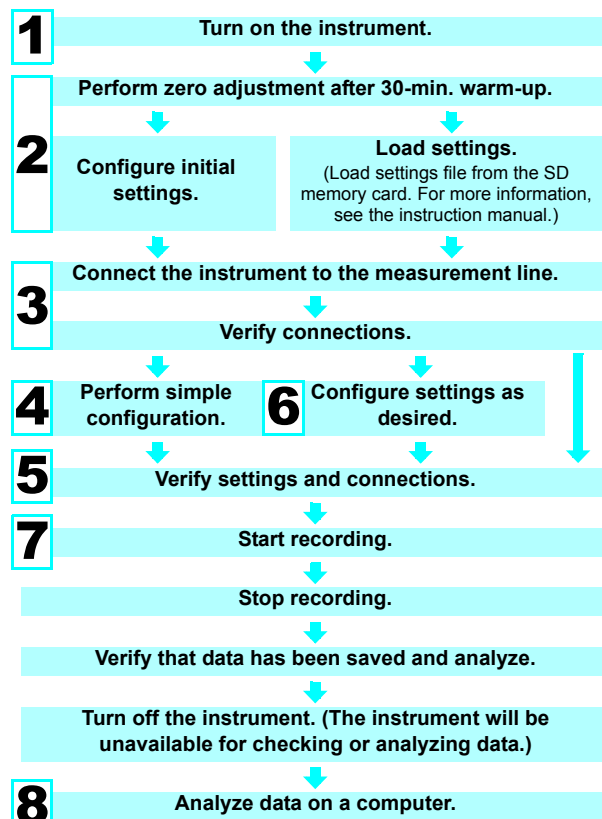
Before using the instrument, be sure to read the instruction manual carefully.

HIOKI

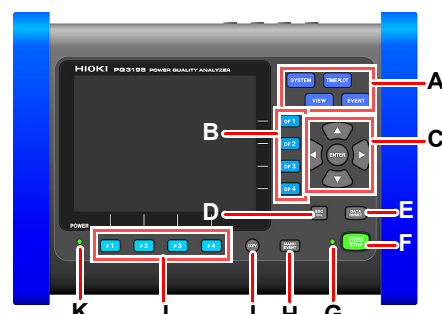
Read First

Measurement Procedure

(Number indicates reference step no.)



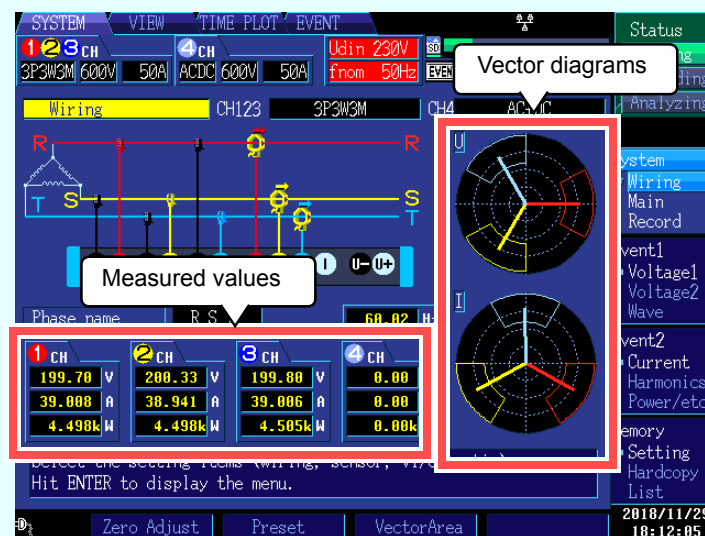
Key functions



- A. Menu keys**
SYSTEM: Configure various settings and event thresholds.
VIEW: Display instantaneous values and waveforms.
TIMEPLOT: Display measurement data as a time series graph.
EVENT: Display measured events as a list.
- B. DF keys**
Select detailed screen display from each screen.
- C. Cursor key, ENTER key**
Select and accept settings.
- D. ESC key**
Cancel selections and changes.
- E. DATA RESET key**
Delete displayed measurement data. (Data stored on the SD memory card will not be deleted.)
- F. START/STOP key**
Start and stop recording.
Recording standby: Flashing green
Recording: Steady green
- G. START/STOP LED**
Recording standby: Flashing green
Recording: Steady green
- H. MANU EVENT key**
Generate events.
- I. COPY key**
Record data on screen currently being displayed.
- J. F keys**
Select and change display content and settings.
- K. POWER LED**
When using AC adapter: Steady green
When using battery: Steady red

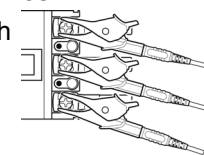
3 Verify connections to the measurement line.

Connect the instrument to the measurement line, referring to the connection diagram shown on the screen.



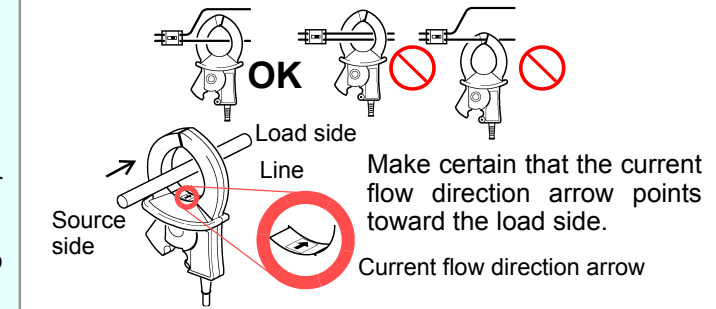
Attach voltage cords to measurement lines

Securely clip the leads to metal parts such as terminal screw terminals or bus bars. (Example: Secondary side of breaker)



Applying clamp sensors to lines to be measured

Always clamp the instrument around only one conductor. Clamping the instrument around two or more of conductors in a bundle prevents the instrument from measuring any current regardless of whether the measurement target is a single-phase or three-phase circuit.



4 Simple configuration

Settings such as the current range, nominal input voltage, measurement frequency, and event thresholds will be automatically configured based on the selected connection mode.

(You will need to set the measurement line type, current sensor type, and external VT/CT ratio.)
Example: Configuring settings for the abnormal voltage detection pattern
Select from the five available patterns according to your objective. To investigate the cause of a power supply issue, select the abnormal voltage detection pattern. To investigate power supply quality (i.e., to monitor a power system), select the basic power supply quality measurement pattern.



Easy setting course patterns

Setting Contents	Description
Voltage event detection	Monitors voltage factors (dips, swells, interruptions, etc.) and frequency to detect events. This pattern is used to investigate the cause of equipment malfunctions. The TIMEPLOT interval will be set to 1 minute.
Standard Power Quality	Monitors voltage factors (dips, swells, interruptions, etc.), frequency, current, voltage and current harmonics, and other characteristics to detect events. This pattern is primarily used to monitor systems. The TIMEPLOT interval will be set to 10 minutes.
Inrush Current	Measures rush current. The TIMEPLOT interval will be set to 1 minute, and the rush current threshold will be set to 200% of the RMS current (reference value) set during simple configuration.
Record measured value	Records measured values over an extended period of time using a TIMEPLOT interval of 10 minutes. All event detection functionality other than manual, start, and stop events is turned off.
EN50160	Performs EN50160-compliant measurement. Standard-compliant evaluation and analysis can be performed by analyzing data using the application software PQ ONE, which is supplied with the instrument.

For more information about settings, see the instruction manual.

1 Getting ready

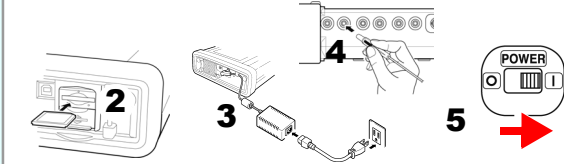
For more information, see the instruction manual.

After purchasing the instrument (first time only)

- Attach the Z1003 Battery Pack to the instrument.
- Turn on the instrument and set its clock.

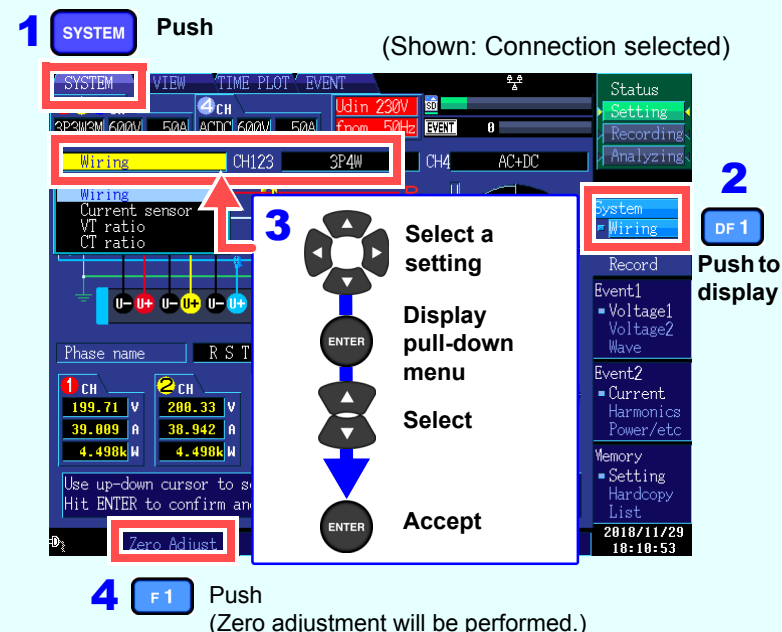
Preparation before measurement

- Perform the pre-measurement inspection.
- Insert an SD memory card into the instrument. (Be sure to close the cover.)
- Connect the AC adapter.
- Connect the voltage cords and current sensors.
- Turn on the instrument.

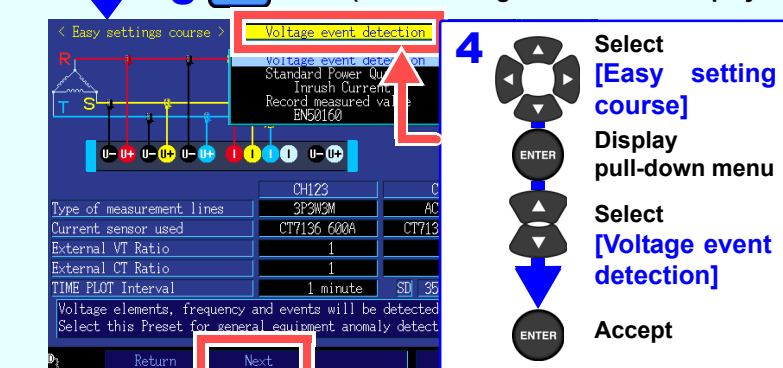


2 Initial settings

Perform zero adjustment. Configure the connection and current sensor settings.



3 **F2** Push (The following screen will be displayed.)



5 **F2** Push (The following screen will be displayed.)

6 Verify [Declared input voltage] and [Frequency]

These values will be set automatically. Change the values if they are incorrect.

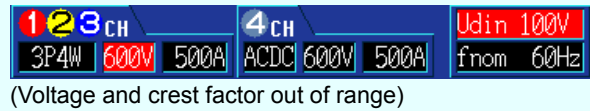
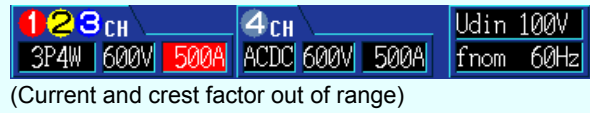
7 **F2** Push (A message informing you that the simple configuration process is starting will be displayed. Select [Yes] to continue with the process.)

5 Verifying settings and connections

-1. Are measured values or crest factors out of range?

If you see any warning indicators, the clamp sensor, range, or connection settings may be incorrect. Verify the connections and return to step (2) to reconfigure the initial settings.

Warning indicators: Values shown in red as below.

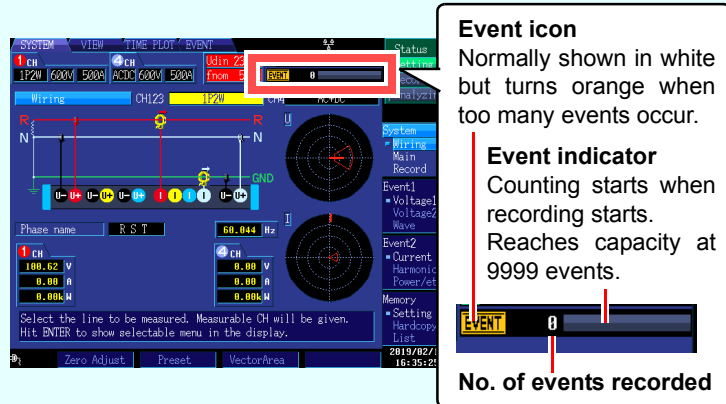


-2. Are too many events occurring?

(Is the **EVENT** icon shown continuously?)

If too many events are occurring, check which events are being generated on the event list on the **[EVENT]** screen (see step 7) after recording some data and then change the thresholds for the problematic events.

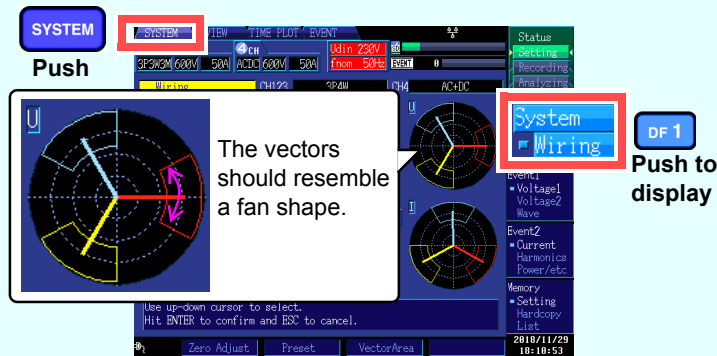
Alternately, wiring (connections) to the measurement line may be incorrect. Verify the connections.



- Up to 9999 events can be recorded. (when **[Max. recordable events]** is set to **[9999]**.) Measurement data continues to be recorded even when the number of events exceeds 9999.

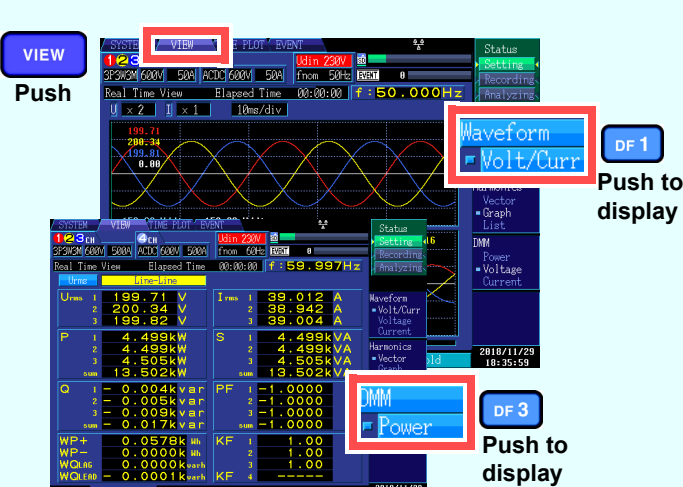
-3. Are the voltage and current phase relationships shown properly in the vector diagrams?

If not, the wiring (connections) to the measurement line or current sensor orientations may be incorrect. Verify the connections and current sensor orientations.



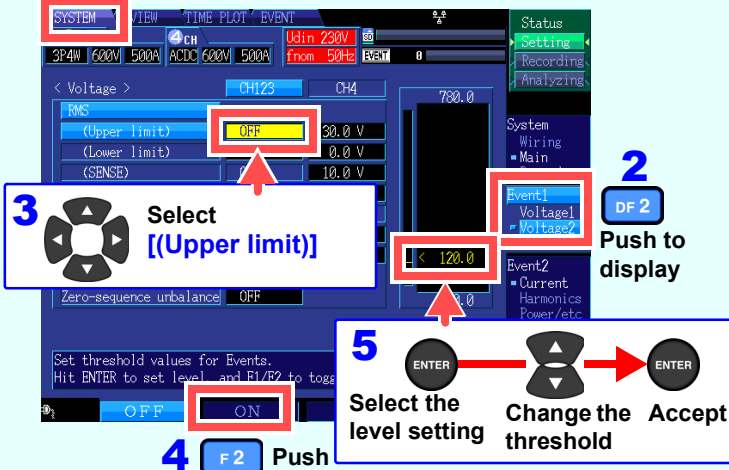
-4. Are waveforms and measured values shown properly?

If waveforms and measured values are not shown properly, the clamp sensor, range, or connection settings may be incorrect. Return to step 2 to reconfigure the initial settings. Alternately, wiring (connections) to the measurement line or current sensor orientations may be incorrect.



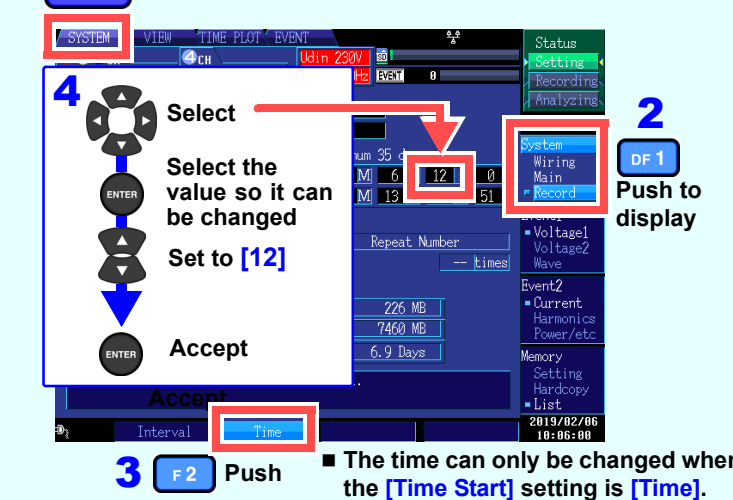
6 User settings (changing settings)

1 **SYSTEM** Push Example: To change the voltage RMS (Upper limit)



You can change event thresholds, the recording start date and time, recorded items, and other settings as desired.

1 **SYSTEM** Push Example: To change the **[Time Start]** start date and time (example: set to 12:00)

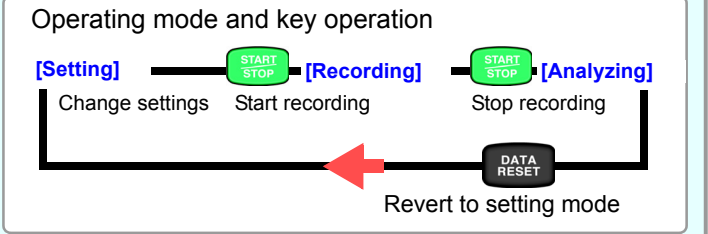


7 Starting recording

Press the **START/STOP** key to start recording. Data will be automatically saved to the SD memory card.



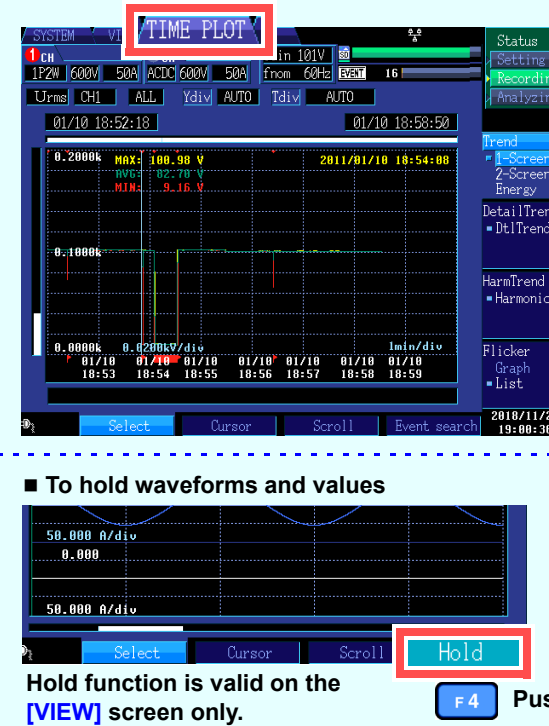
- When recording, the operating mode indicator on the top right of the screen will show **[Recording]**.
- To change a setting, set the operating mode to **[Setting]**. (Settings cannot be changed while recording or analyzing.)



TIMEPLOT Monitoring fluctuations in measured values

You can view measured items in the form of a time series graph. You can also display flicker values as a graph or list.

Press the **TIMEPLOT** key to display the **[TIMEPLOT]** screen. You can change the screen display with the **DF** keys.



- To hold waveforms and values

- To active the key lock

ESC Press and hold for at least 3 seconds. To cancel the key lock, press and hold for at least 3 seconds again.

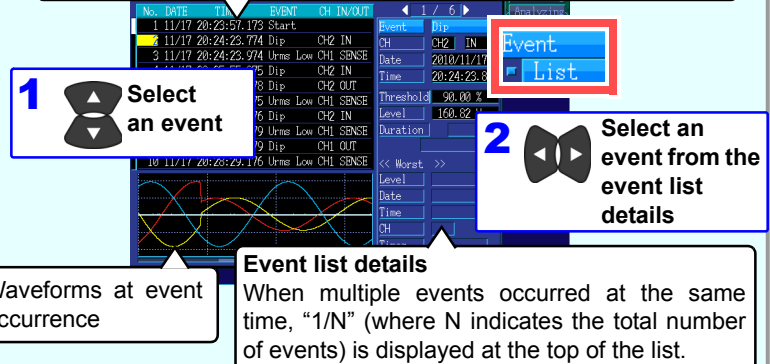
- To check instantaneous values

VIEW Push (Switch screens with the **DF** key.)

EVENT Monitoring event generation

You can check whether events are occurring and the number of events occurring with the event list.

Press the **EVENT** key to display the **[EVENT]** screen.



8 Analysis

After recording has stopped, data can be analyzed on a computer using the application software PQ ONE, which is supplied with the instrument.

- For more information, see the PQ ONE instruction manual (on the included CD-ROM).

★ Viewing data

Use event statistics functionality to analyze measurement data at a high level of detail. By reviewing event occurrence by date or time, you can discover events that are likely to occur at a specific time or on a specific day of the week.

★ Easily create graphs to suit your needs

Organize time plot graphs by convenient times or group three phases of data together on a single graph.

★ Converting data

Convert event data and time plot data (binary data) to the CSV format so that it can be opened with a spreadsheet application on a computer.

★ Creating reports

Output information shown on the screen as-is in the form of a report. Create reports that suit your needs without the need to configure complex settings.

★ Display file data in list form

Drag and drop folders containing measurement data to display a list of settings information and event occurrence data for all the data contained in the folder.

★ Calculating demand and integral power

Display a demand graph, or display the maximum and integrated power values for a specified interval.