GF438R

RACK-MOUNTED THREE PHASE POWER QUALITY RECORDER

The GF438R Rack-mounted power quality recorder is a high-end power quality monitoring device independently developed by GFUVE GROUP. It follows the national standard and international standard IEC 61000-4-30/IEC 61000-4-15/IEC 61000-4-7/IEEE 1459/EN 50160 etc for general requirements of power quality monitoring equipment and integrates multiple functions such as voltage and current sampling, harmonic analysis, fluctuation and flicker monitoring, unbalance monitoring, fault recording, event recording, and IEC61850 remote communication protocol.

GF438R can measure multiple input signal parameters, including voltage RMS, current RMS, and phase angle; Harmonic content, effective value, phase angle; Interharmonic content and effective value; Voltage fluctuations and flicker; Voltage and current unbalance; Active power, reactive power, apparent power, power factor, harmonic power.

GF438R has event recording function, which includes recording frequency deviation; Voltage and current effective value deviation; Voltage and current harmonics exceed the limit; Flashing beyond the limit; Unbalance exceeding the limit; Voltage rise, voltage drop, voltage interruption, surge current, etc.

GF438R device does not lose data during power outage and recovery, and there are no measurement errors at the moment of power outage; During the power restoration period, the monitoring device automatically returns to its working state before the power outage.

Application

1. Power quality;
2. Power generation;
3. Wind power plant;
4. Power distribution;
5. Hydroelectric power;
6. Renewable power plants;
7. Electricity power company;
8. Photovoltaic power station;
9. Effects of power quality issues on living and working environment;

Functions

1. Original waveform display and measurement

Monitor the 63rd harmonic component of the tested signal, including distortion rates of 1st to 63rd harmonics, total harmonic distortion rate, harmonic phase angle, and interharmonics, to meet the testing requirements of GB/T 14549 and IEC61000-4-7 for harmonics in public power grids.

2. harmonic analysis

The harmonic analysis function can analyze the harmonic, interharmonic, and high-order harmonic information of all user circuits, up to the 63rd harmonic. The content includes harmonic amplitude, phase, content, and other information such as THD value. You can freely choose to observe data in table or bar chart format.

3. Voltage fluctuations and fault recording

Capable of capturing waveforms of all voltage and current channels and analyzing interference sources. Harmonic components exceeding the standard, distortion rate exceeding the standard, voltage effective value exceeding the standard, short circuit faults, etc. can all initiate voltage waveform and fault recording to capture subtle changes in voltage waveform.

4. Component measurement and voltage unbalance analysis

It can measure the unbalance of voltage and current, as well as the amplitude and phase of zero sequence, positive sequence, and negative sequence, and display the phase diagram of voltage and current.

5. Record of steady-state events in power quality

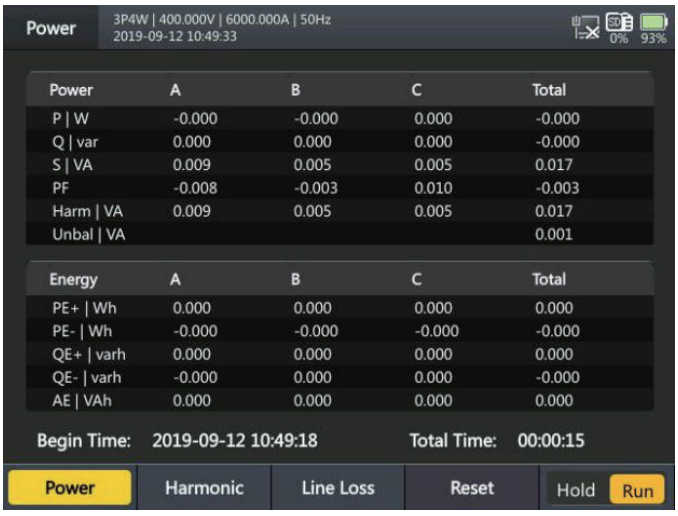
The GF438R power quality recorder can continuously monitor steady-state events of power quality without interruption. Different triggering conditions can be set through software to start the statistics of excessive power parameters and record the corresponding superscalar, with a time resolution of 1ms.

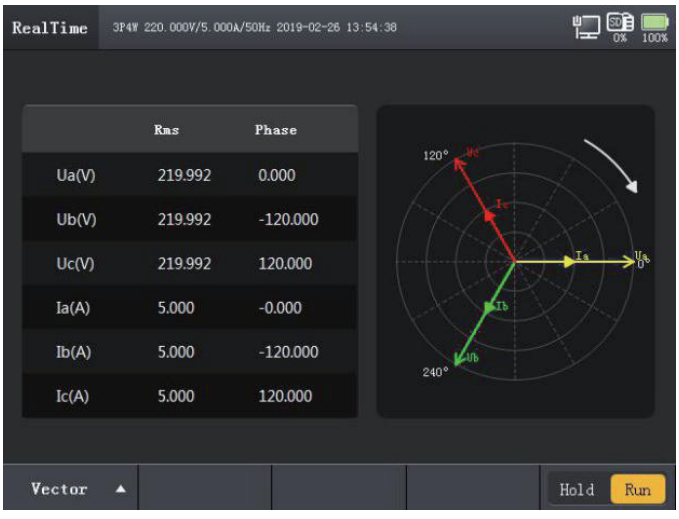
6. Transient event recording of power quality

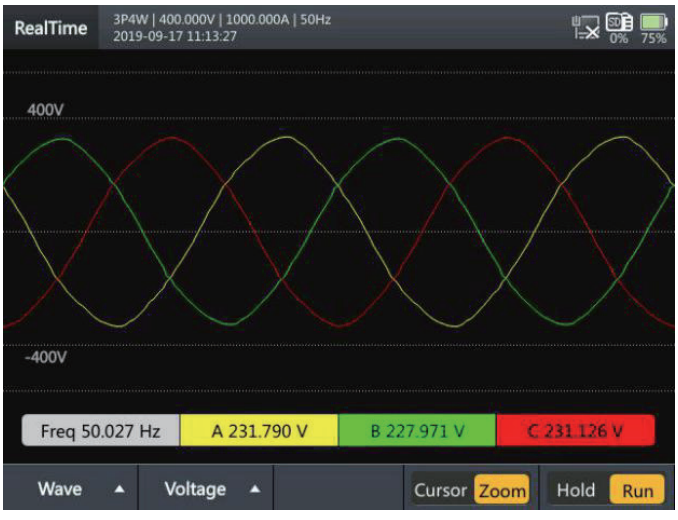
TheGF438R power quality recorder can continuously monitor transient events of power quality without interruption. Different triggering conditions can be set through software to start the statistics of excessive power parameters and record the corresponding superscalar, with a time resolution of 1ms.

Display


Main
3P4W | 400.000V | 6000.000A | 50Hz
2019-09-11 12:13:03
Guide
RealTime
Harmonic
Unbalance
Power
Flicker
Trend
Setting
Wave Record
Statistics
File
Enter


Power
3P4W | 400.000V | 6000.000A | 50Hz
2019-09-12 10:49:33
Power A B C Total
P | W -0.000 -0.000 0.000 -0.000
Q | var 0.000 0.000 0.000 -0.000
S | VA 0.009 0.005 0.005 0.017
PF -0.008 -0.003 0.010 -0.003
Harm | VA 0.009 0.005 0.005 0.017
Unbal | VA 0.001
Energy A B C Total
PE+ | Wh 0.000 0.000 0.000 0.000
PE- | Wh -0.000 -0.000 -0.000 -0.000
QE+ | varh 0.000 0.000 0.000 0.000
QE- | varh -0.000 0.000 0.000 -0.000
AE | VAh 0.000 0.000 0.000 0.000
Begin Time: 2019-09-12 10:49:18
Total Time: 00:00:15
Power
Harmonic
Line Loss
Reset
Hold
Run


RealTime
Rms Phase
Ua(V) 219.992 0.000
Ub(V) 219.992 -120.000
Uc(V) 219.992 120.000
Ia(A) 5.000 -0.000
Ib(A) 5.000 -120.000
Ic(A) 5.000 120.000
120°
240°
Vector
Hold
Run


RealTime
3P4W | 400.000V | 1000.000A | 50Hz
2019-09-17 11:13:27
400V
-400V
Freq 50.027 Hz
A 231.790 V
B 227.971 V
C 231.126 V
Wave
Voltage
Cursor
Zoom
Hold
Run

PC Software

Parameters

Name	Measurement type
Voltage	rms, ava, pk+, pk-, rms-1/2, CF
Frequency	Freq
Current	rms, ava, pk+, pk-, rms-1/2, CF
Power & energy	P, S, Q, PF, DPF, W
Computation	THD, DC, 1-63 Harm, 1-62 InHarm, 1-35 HiHarm, 1-62 SubHarm
Voltage harmonic	THD, DC, 1-63 Harm, 0-62 InHarm, 1-35 HiHarm, 1-62 SubHarm , KF
Current harmonic	THD, DC, 1-62 Harm
Harmonic power	Ia, Ib, Ic, ΣPtotal, ΣQtotal, ΣStotal, 15 minutes
Fluctuation and flickering	PST, PLT, Fluct, Fluct Max
Unbal	V Pos, A pos , V neg , A neg , V zero, A zero, Unbal
Event log	Voltage swell, voltage sags, DIP, surge current, voltage and current distortion out of limit, odd harmonics containing rate out of limited, unbalanced voltage current out of limit, frequency out of limit, PST ou of limit, PLT out of limit, long-term voltage interruption, voltage fluctuation deviation, voltage harmonics out of limit, 2-25st

P, Q, S name	Measurement type
Measurement types	P: Calculate by every 10 cycles S: Calculated by the effective value of voltage and current Q: Calculated by the apparent power, active power
Display	Table charts, trend chart
Measuring range	According to the range of the voltage and current
Resolution	0.001W
Accuracy	±0.5%
Urms	**Measurement type**
Mode	Calculated by the square root value of 10/12 cycle
Measuring circuit	1P2W/ 2P3W /3P3W/ 3P4W
Basic frequency of the measuring circuit	50Hz, 60Hz
Input channels	4 channel voltage, 4 channel current(stanadard); max 24 channel voltage, 24 channel current;
Display mode	Effective current value of each channel
Range	120V, 230V, 400V, 750V, Max 750V instantaneous voltage
Resolution	0.001V
Accuracy	0.1% RG
Arms	**Measurement type**
Mode	Calculated by the square root value of 10/12 cycle
Display mode	Effective current value of each channel
Range	5A/1A 1.2 times rated current continuous, max 50A/1s
Resolution	0.001A
Accuracy	0.1%
Frequency	**Measurement type**
Measurement mode	Calculate by 10 cycles (50Hz) or (60Hz)
Display mode	Measurement by 10 cycles
Nominal frequency/resolution	50.000Hz/0.001Hz or 60.000Hz/0.001Hz
Bandwidth measurement	40Hz-70Hz
Accuracy	±0.001Hz
Half-wave RMS current/voltage	**Measurement type**
Measurement mode	Calculate by every 2 cycles. Each cycle ,1/2 cycle made up of a waveform calculation
Measuring range/resolution	Voltage: 120V/0.01V, 230V/0.01V, 400V/0.01V, 750V/0.01V,Current: According to the current clamps
measurement accuracy	±0.1%
Power factor	**Measurement type**
Measurement mode	The ratio of average power to apparent power
Display mode	Real-time data showed
Measurement range/resolution	-1.000-1.000/0.001
Accuracy	±0.1%

Vfund, Afund, Harmonic power	Measurement type
Measurement mode	Meet IEC61000-4-7,Analysis time window is ten cycles
Window points	5120 points
Display mode	Form figure, trend charts, histograms
Number of measurement	1-50 Times(25Hz-3150Hz)
Measurement accuracy	Vfund >1%: Error<1% Vfund <1%: Error<0.05% Rated Voltage Afund >3%: Error<1% Afund <3%: Error<0.05% Current range
InHarm Voltage, InHarm current	**Measurement type**
Measurement mode	Meet IEC61000-4-7, Analysis time window is ten cycles
Window points	5120 points
Display mode	Form figure, trend charts, histograms
Numbers of measurement	1-16 groups
Measurement accuracy	Vfund >1%: Error<1% Vfund <1%: Error<0.05% Rated Voltage Afund >3%: Error<1% Afund <3%: Error<0.05% Current range
HiHarm Voltage, HiHarm current	**Measurement type**
Measurement mode	Meet IEC61000-4-7, Analysis time window is ten cycles
Window points	5120 points every 10 cycles
Display mode	Form figure, trend charts, histograms
Numbers of measurement	1-35 groups/2100Hz-8900Hz
Measurement accuracy	Vfund >1%: Error<1% Vfund <1%: Error<0.05% rated voltage Afund >3%: Error<1%
Voltage SubHarm Current SubHarm	**Measurement type**
Measurement mode	Meet IEC61000-4-7, analysis time window is ten cycles
Window points	5120 points every 10 cycles
Display mode	Form figure, trend charts, histograms
Numbers of measurement	1-50 groups
Measurement accuracy	Vfund >1%: Error<1% Vfund <1%: Error<0.05% Rated Voltage Afund >3%: Error<1%
Voltage/current Unbal (pos, neg)	**Measurement type**
Measurement mode	3P3W or 3P4W, using three phase of fundamental wave components to calculate
Display mode	Form figure, trend charts, histograms
Measurement accuracy	Voltage unbal: ±0.2% Current unbal: ±0.5%

Vfund, Afund, Harmonic power	Measurement type
Measurement mode	Meet IEC61000-4-7,Analysis time window is ten cycles
Window points	5120 points
Display mode	Form figure, trend charts, histograms
Number of measurement	1-50 Times(25Hz-3150Hz)
Measurement accuracy	Vfund >1%: Error<1% Vfund <1%: Error<0.05% Rated Voltage Afund >3%: Error<1% Afund <3%: Error<0.05% Current range
InHarm Voltage, InHarm current	**Measurement type**
Measurement mode	Meet IEC61000-4-7, Analysis time window is ten cycles
Window points	5120 points
Display mode	Form figure, trend charts, histograms
Numbers of measurement	1-16 groups
Measurement accuracy	Vfund >1%: Error<1% Vfund <1%: Error<0.05% Rated Voltage Afund >3%: Error<1% Afund <3%: Error<0.05% Current range
HiHarm Voltage, HiHarm current	**Measurement type**
Measurement mode	Meet IEC61000-4-7, Analysis time window is ten cycles
Window points	5120 points every 10 cycles
Display mode	Form figure, trend charts, histograms
Numbers of measurement	1-35 groups/2100Hz-8900Hz
Measurement accuracy	Vfund >1%: Error<1% Vfund <1%: Error<0.05% rated voltage Afund >3%: Error<1%
Voltage SubHarm Current SubHarm	**Measurement type**
Measurement mode	Meet IEC61000-4-7, analysis time window is ten cycles
Window points	5120 points every 10 cycles
Display mode	Form figure, trend charts, histograms
Numbers of measurement	1-50 groups
Measurement accuracy	Vfund >1%: Error<1% Vfund <1%: Error<0.05% Rated Voltage Afund >3%: Error<1%
Voltage/current Unbal (pos, neg)	**Measurement type**
Measurement mode	3P3W or 3P4W, using three phase of fundamental wave components to calculate
Display mode	Form figure, trend charts, histograms
Measurement accuracy	Voltage unbal: ±0.2% Current unbal: ±0.5%

Voltage fluctuation	Measurement type
Measurement mode	Calculate by the quadratic mean of half wave.
Display mode	Form figure, trend charts
Measurement accuracy	±1%
IEC Flickering	**Measurement type**
Measurement	P short term (Pst) , P long term (Plt)
Measurement mode	According to IEC61000-4-15 Standard to calculate Pst (10 mins) Plt (2 hours)
Display mode	Form figure, trend charts
Measurement range	0-20
Measurement accuracy	±5%
Surge current	**Measurement type**
Measurement mode	Half-wave RMS of current is higher than set value and sustain time is 10ms-1min
Display mode	Maximum of the surge current and surge current wave
Measurement accuracy	0.1%
Voltage swell, Voltage sags, DIP	**Measurement type**
Measurement mode	Swell: When half-wave RMS of voltage is higher than set value and sustain time is 10ms-1min, judged as swell. Sags: When half-wave RMS of voltage is lower than set value and sustain time is 10ms-1min, judged as sags. DIP: half-wave RMS of voltage is higher than set value and sustain time is 10ms-1min, judged as DIP
Display mode	Swell, sags, DIP wave sustain time, extent and so on.
Measurement accuracy	0.1%
Machinery	
Size	482.8mm x 277.5mm x 177mm
Key	12PCS
Binary	binary input:5 ; binary output:5
Comunication Port	USB 2PCS, 10/100M port 2PCS, 4G 1PC, RS485 2PCS
Weight	5.5KG, 9.5KG(24U/24I)
Communcation	
Comunication Protocol	IEC61850, IEC-103, MODBUS
Power supply	
Voltage input	85V-265V AC / 100-370V DC
Display	
Size	112.8 x 84.6mm
Color	260000 color
Resolutions	640 x 480
Brightness	Max 350 cd/m2 (Typ), brightness is adjustable
Contrast	500:1 (Typ)
Visual angle	70/70/50/70 (Typ.)(CR ⩾10) (Left/ Right/ UP/Down)

Store	
Type	TF card (inbuilt)
Size	64G
Function	
Vrms & Irms waveforms(8 channel)	Yes
Power/Energy	Yes
Voltage/Current harmonics	Yes
Harmonics Power	Yes
Flicker	Yes
Unballance	Yes
Inrush current	Yes
Event log	Yes
Transient monitoring	Yes
Data format	PQDIF, Comtrade
GPS	Yes
4G communication	Yes, Optional
Remote control	Yes
Networking management	Yes
PC software	Yes
Environment	
Working environment	-10°C to +45°C, humidity below 90rh%
Storing environment	-20°C to +50°C, humidity below 95rh% (non-condensing)
Standards	
Measurement method	IEC 61000-4-30
Measurement performance	IEC 61000-4-30 A LVL, IEC 62586
Flickering	IEC 61000-4-15
Harmonic	IEC 61000-4-7, IEEE 519
Power	IEEE 1459
Power quality compliance	EN 50160
Safety	
Standard	GB 4793.1-2007/IEC 61010-1:2001: "Measurement, control and laboratory electrical equipment safety requirements", first part: general requirements.
MAX voltage of phase angle input	CAT III 1000V/CAT IV 600V