ATZ1000 Integrated Monitoring Unit

User's Manual

V1.0

Hangzhou Antin Power Technology Co., Ltd

Declarations

The Company reserves the right to modify the product specifications described in this manual without prior notice. Before ordering, please contact our company or local agent for the latest specifications of this product.

Content

Chapter 1 Product Overview

1.1 Product Introduction

ATZ1000 series multifunctional power analyzer can accurately measure and display various power parameters in three-phase three-wire and three-phase four-wire power grids: voltage, current, power, frequency, active power, reactive power, forward power, reverse power, power factor, total harmonic distortion, sub-harmonics, and maximum demand, etc. It is suitable for real-time power monitoring system. It is suitable for real-time power monitoring system, featuring multi-function, multi-purpose, high stability and long life. The meter adopts external transformer access, applicable to various high and low voltage power grids. With RS485 communication interface, supporting the highest communication rate of 38400bps, it can realize remote communication, which is ideal for power energy monitoring. Setting parameters can be realized through the touch keys on the panel, easy to operate and password protected, good security.

1.2 Product Features

- Circumferential sampling not less than 128 points, support for telecommunication, remote control, telemetry
- Compatible with full grid system type access
- Measurement of split-phase and total power parameters
- Sub-harmonic measurements up to 31st
- Support RS-485 communication

- Communication rate up to 38400bps
- Touch key operation, user-friendly interface settings
- High-resolution large screen, gray background and black characters with a wide field of view
- Phase-by-phase and total power and current demand statistics
- Demand calculation mode, update period, slip time can be set
- Bidirectional metering, split-phase active and reactive power metering
- Backlight delay can be set
- 8 time slot settings, 4 rate metering
- 1A/5A transformer type access, variable ratio settable
- Intelligent setting for forward and reverse wiring of split-phase transformers
- DI input stabilization time can be set according to actual demand
- DO level and pulse output can be set according to the actual demand.
- DO output delay can be set according to actual demand
- Pull-in connection

1.3 Product Parameters

Parameters that can be measured and displayed	
Instantaneous value (RMS)	
Input voltage	Phase Voltage, Line Voltage
Current	Three-phase current
Active power	Total active power, split-phase active power
Reactive power	Total reactive power, split-phase reactive power
Apparent power	Total apparent power, sub-phase apparent power

Frequency	45-65Hz
Power factor	Total power factor, split-phase power factor
Total/forward/reverse active power	Range：0~9999999.9kWh
Harmonic distortion	Voltage, current
Subharmonic	31times
Requirement	Split-phase and total power and current
Settable parameters	
Modbuscommunications class	ModbusCommunication Address, Baud Rate, Parity Bit
Variant analogy	CT, PT ratio and secondary value
System type	User password
Demand class	Demand reset
Pulse output class parameters	Pulse output setting
Time-based parameter	Backlight illumination time, system time, start of the rate segment

Chapter 2 Technical Specifications

2.1 Technical Parameters

Technical Parameters	norm
Applicable networks	Three-phase four-wire, three-phase

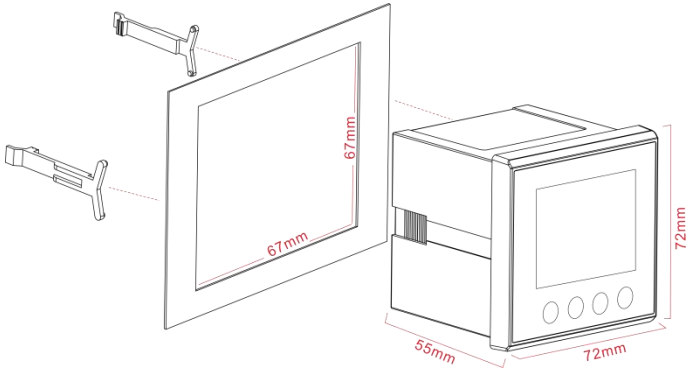
			three-wire
Operating power	Voltage range		AC/DC85~265V
	Power wastage		≤5W
Input	Input voltage	Rating	AC100V、220V、400V
		Overloaded	1.2x continuous, 2x (10s)
		Power wastage	<0.4VA/Phase
		Impedance	≥200kΩ
	Current	Primary current	1-9999A
		Secondary input	1A or 5A
		Short-term overcurrent	20x maximum current for 0.5 seconds
		Power wastage	<0.2VA/Phase
		Impedance	≥0.1Ω
	Frequency		45Hz~65Hz
	Switching input		Dry Contact Input, Opto-Isolated
Output	Switching output		Relay output; any power alarm can be set, default remote control
Precision indicators	Voltage/current		0.5%
	Frequency		0.2%

	Power/Power Factor	1%
	Active degree of electricity	0.5S class
	Reactive power	1.0 class
Communication	Bus Type	RS485
	Communication protocols	Modbus RTU
	Baud	2400/4800/9600/19200/38400bps
	Address range	1-247
	Bus Load	64pcs
	Communication distance	1000m
	Parity	EVEN/ODD/NONE(default）
	Data bit	8
	Stop bit	1
Circumstances	Operating temperature	-25℃~55℃
	Storage temperature	-40℃~70℃
	Operating humidity	≤90%RH，Non-condensing, non-corrosive gas locations
	Storage humidity	≤95%RH，Non-condensing, non-corrosive gas locations
	Height above sea level	≤2000m
Installation category		CATIII

Pressure resistance		AC withstand voltage 4KV/1min Pulse withstand voltage 6kV - 1.2μS waveform
Protection class		IP51（interior）
Insulation class		II
Average trouble-free operation time		≥50000h
EMC Electromagnetic compatibility test	Electrostatic discharge immunity test	GB/T 17626.2-2006：Test level 4, test voltage 8kV
	Radio Frequency Electromagnetic Field Immunity Test	GB/T 17626.3-2006：Test level 3, test field strength 10V/m
	Rapid transient pulse group test	GB/T 17626.4-2008：Test level 2, current voltage 1kV, other 500V
	Surge (shock) immunity test	GB/T 17626.5-2008：Test level 4, test voltage 4kV
	Conducted Nuisance Immunity Test for RF Field Induction	GB/T 17626.6-2008：Test level 3, test field strength 10V/m
	Immunity tests for voltage dips, short-term interruptions and voltage variations	GB/T 17626.11-2008：Current and voltage test error qualified

	Shock wave immunity test	GB/T 17626.12-1998：Class B ITE test, pass
Standards-compliant		GBT22264.1-2008 Mounted digital display electrical measuring instruments Part 1: Definitions and general requirements
		GBT22264.7-2008 Mounted digital display electrical measuring instruments Part 7: Special requirements for multifunction meters
		GBT22264.8-2009 Mounted digital display electrical measuring instruments Part 8: Recommended test methods

2.2 Shape/opening dimensions and installation drawings



Chapter 3 Operating Instructions

3.1 Description of panel key operation

After correct wiring, turn on the power to enter the normal measurement state, the screen displays as follows：

First screen	Power on full screen display
Second screen	Show software version
Third screen	Shows internal testing is complete

3.2 Key Definition

There are 4 buttons on the panel, from left to right they are

“ 

”, “ 

”, “ 

”, “ 

”

There are two types of button operation: long press and short press.：

Long press: press the key for more than 2 seconds.

Short press: releasing a key within 1 second after pressing it is considered a short press.

	Short press：1、Display the current grid environment voltage, current value; 2、Return to the previous menu or exit Long press: display each phase power, voltage, current value, current and voltage sub-harmonics, etc.

PF Hz	Short press: 1, display power factor, frequency, maximum demand value; 2, upward; 3, the increment of numbers
P	Short press：1、Display the active power, reactive power, apparent power value in the current grid environment 2、Downward flip; 3、Decreasing of numbers
E	Short press：1、Display the power information in the current grid environment; 2、Cursor moves to the right Long press：1、Enter the setting mode; 2、Setting confirmation key

3.2.1 Measurement Parameter View

keystrokes	Three-phase, four-wire (4-wire)		Three-phase, three-wire (TCM)	
	Demonstrate	Parameters	Demonstrate	Parameters
V/A ESC	1	L1-N voltage L2-N voltage L3-N voltage		
	2	Voltage L1-L2 Voltage L2-L3 Voltage L3-L1	1	Voltage L1-L2 Voltage L2-L3 Voltage L3-L1
	3	L1 current L2 current L3 current N phase current	2	L1 current L2 current L3 current

	4	L1 voltage total harmonic L2 voltage total harmonic L3 voltage total harmonic	3	L1-2 voltage total harmonics L2-3 voltage total harmonics L3-1 voltage total harmonics
	5	L1 current total harmonic L2 current total harmonic L3 current total harmonic	4	L1 current total harmonic L2 current total harmonic L3 current total harmonic
PF Hz	1	Total power factor Frequency		
	2	L1 power factor L2 power factor L3 power factor	1	L1 power factor L2 power factor L3 power factor
	3	L1 Current Maximum Demand L2 Current Maximum Demand L3 Current Maximum Demand	2	L1 Current Maximum Demand L2 Current Maximum Demand L3 Current Maximum Demand
	4	Maximum total power requirement Maximum reactive power requirement Maximum apparent power requirement	3	Maximum total power requirement Maximum reactive power requirement Maximum apparent power requirement
P	1	L1 active power L2 active power	1	L1 active power L2 active powerL3 Active

		L3 Active power		power
	2	L1 reactive power L2 reactive power L3 reactive power	2	L1 reactive power L2 reactive power L3 reactive power
	3	L1 apparent power L2 apparent power L3 apparent power	3	L1 apparent power L2 apparent power L3 apparent power
	4	Total active power Total reactive power Total apparent power	4	Total active power Total reactive power Total apparent power
E	1	Total active power	1	Total active power
	2	Total reactive power	2	Total reactive power
	3	Positive active power	3	Positive active power
	4	Reverse active power	4	Reverse active power
	5	Positive reactive power	5	Positive reactive power
	6	Reverse reactive power	6	Reverse reactive power
	7	Active power in the first period	7	Active power in the first period
	8	Second period active power	8	Second period active power
	9	Third period active power	9	Third period active power
	10	Active power in the fourth	10	Active power in the fourth

		period		period
	11	Year, month and day of the real-time clock	11	Year, month and day of the real-time clock
	12	Real-time clock hours, minutes and seconds	12	Real-time clock hours, minutes and seconds

3.2.2 Split-phase parameters and harmonics

	View the power, voltage, current, active power, reactive power of each phase
	View voltage subharmonics from 2nd to 31st.
	View current subharmonics from 2nd to 31st.
	View communication parameters, PT, CT, software version, etc.

Chapter 4 Basic setup

4.1 Password access

	The setup mode is password protected and you need to enter the correct password before entering the setup mode. long press E The setup screen appears, the number on the far left of the screen blinks, and the default password is 1000. Press PF Hz P keyenter a password，short press E confirmation number，lastly, long press E confirm password. An incorrect password displays ERR.

4.2 Communication settings

	Communication Setting Interface The following parameters are optional: address, baud rate, parity bit, stop bit

4.2.1 Address Settings

	Set the communication address of the meter Range: 001~247 Default: 001

4.2.2 Baud rate setting

	Set the communication baud rate of the meter Options: 2400/4800/9600/19200/38400(bps) Default: 9600bps

4.2.3 Check Digit Setting

	Setting the communication parity bit of the meter Options: NONE, EVEN, ODD Default: NONE

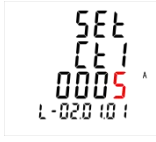
4.3 System Parameter Setting

	System parameter setting main interface The following parameters are optional: CT, PT, line system, current direction, password

4.3.1 CT Settings

	CT Setting Screen The following parameters are selectable: CT1, CT2

4.3.1.1 CT1 set up

	Set the primary measurement current of the meter Range: 1~9999 Default CT1: 5A

4.3.1.2 CT2 set up

	Setting the secondary measurement current of the meter Options: 5A, 1A Default CT2: 5A

4.3.2 PT set up

	PT Setting Screen The following parameters are selectable: PT1, PT2

4.3.2.1 PT1 set up

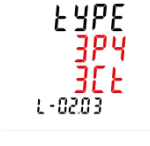
	Setting the primary measurement voltage of the meter

	Range: 1~600000 Default PT1: 230V

4.3.2.2 PT2 set up

	Set the secondary measurement voltage of the meter Range: 100~599 Default: 230V

4.3.3 Wire System Setting

	Setting the wiring system of the meter
	Options: 3P4 3CT (three-phase four-wire 3CT), 3P3 2CT (three-phase three-wire 2CT) Default: 3P4 3CT

4.3.4 Current direction setting

	Current Direction Setting Screen This meter can correct for inverted transformers. (Inverted transformer in/out can be set by the meter without removing wires)
	Set the current direction of phase A of the meter Options: Frd (forward wiring), rEv (reverse wiring) Default: FRD (forward wiring)
	Set the direction of B-phase current of the meter Options: Frd (forward wiring), rEv (reverse wiring) Default: FRD (forward wiring)
	Set the current direction of phase C of the meter Options: Frd (forward wiring), rEv (reverse wiring) Default: FRD (forward wiring)

4.3.5 Password Setting

	Setting the password for the meter Options: 0000~9999 Default: 1000

4.4 Demand cycle setting

	Demand cycle setting

4.4.1 Demand mode setting

	Setting the meter's demand mode Options: Slip mode, Interval mode

4.4.2 Demand update cycle setting

	Setting the demand update period of the meter Range: 0-60, off means turn off this function Default: 60 (minutes)

4.5 Time setting

	time setting

4.5.1 Backlight Time Setting

	Setting the backlight time of the meter Options: on, off, 5, 10, 30, 120 Default: 5 (minutes)

4.5.2 Real Time Clock Setting

	Setting the real-time clock of the meter

4.5.2.1 Year, month and day settings

	Setting the year, month and day of the meter's real-time clock

	Currently showing: April 28, 2024

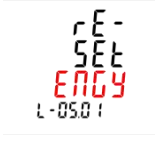
4.5.2.2 Setting of hours, minutes and seconds

	Setting the hour, minute and second of the meter's real-time clock
	Current display: 08:37:36

4.5.3 Rate Time Setting

	Setting the meter's rate time
	Setting time period and corresponding rate 01-Time period number,range:01 to 08 FEE1-Rate 1,range 1~4. 06:00-Start time of the time period,form:HH-MM

4.6 Zero

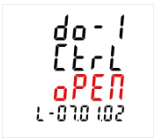
	Zeroing of power (including active power, reactive power, apparent power, forward and reverse power).
	Current Demand, Power Demand Zero.
	Maximum and minimum value clearing
	SOE (event logging) cleared to zero
	DI count clear

	所有参数清零。

4.7 Digital Input (DI)

	Digital Input (DI) Interface
	Setting the duration of the DI filter of the meter Current display: 100mS
	Displays the count of each digital input of the meter
	The figure on the left shows digital input 1, count 10.

4.8 Digital Output (DO)

	Digital Output (DO) Interface
	Select the number of digital outputs to be viewed DO-1 is shown on the left.
	Setting the Digital Output Mode of DO-1 Shown on the left: LEVE LEVE=Level Level Mode PULS=Pulse Mode
	Setting the pulse of DO1
	Used to control the status of DO-1. The left figure shows the status as disconnected.

4.9 DO Alarm settings

	DO Alarm Setting
	Select the DO to be set DO1 is shown on the left.
	The alarm function can be associated to the following parameters:U1,U2,U3,Unav(L-N) U12,U23,U31,Uuav(L-L) I1,I2,I3,Iav,In P1,P2,P3,P-total Q1,Q2,Q3,Q-total S1,S2,S3,S-total PF1,PF2,PF3,PF-total F(frequency) Null means that no parameters are associated with it.
	Set the DO action delay time in ms. The figure on the left shows 200ms.

	This option sets the high value for DO-1 closure. The figure on the left shows: HC 1000V, indicating that DO-1 will close when U1 reaches 1000V.
	This option sets the high value at which DO-1 disconnects. The graph on the left shows: HO 800V, indicating that DO-1 will disconnect when U1 drops to 800V.
	This option sets the low value at which DO-1 disconnects. The left graph shows LC 110V, indicating that DO-1 will disconnect when U1 rises back to 110B.
	This option sets the low value at which DO-1 closes. The left graph shows LO100V, indicating that DO-1 closes when U1 is below 100V.

Liquid Crystal Segment Code English Correspondence Table

1	2	3	4	5	6	7	8	9	0	A	B
C	D	E	F	G	H	I	J	K	L	M	N
O	P	Q	R	S	T	U	V	W	X	Y	Z

After-sales service

1. If the user does not understand the description in the manual during installation and commissioning, please contact the aftersales team.
2. The company's technology is ready to answer product-related questions.
3. The problems arising in the use of the product will be replied within one working day.
4. Our company has a one-year free warranty for the above products from the date of sale.

Technical descriptions are subject to change without notice

Hangzhou Antin Power Technology Co.,Ltd.
R&D headquarters: 8th floor, Lufang Science and Technology Innovation Building, Xihu District, Hangzhou City, Zhejiang Province
Intelligent manufacturing base: 4th Floor, Building 3, Block C, Qinglan Science and Technology Innovation Park, Xihu District, Hangzhou City, Zhejiang Province
Email: sales@china-antin.com
Website: http://www.china-antin.com