

A Series of power grid simulator

Product User Manual V2.0





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1 Preface

1.1 Preface

Dear customer, Thank you very much for choosing our power grid simulator. We sincerely hope that this product will meet your requirements and look forward to more precious opinions on the performance and function of this product. We will continue to improve and continuously improve product performance and service quality.

1.2 General information

Retention and use

This manual should be placed near the product for reference. It needs to be transferred when the device is moved or the user changes.

Copyright

It is strictly forbidden to reprint or copy the user manual for any other purpose, otherwise you will be liable for the lawsuit from this act.

Effectiveness

This manual applies to our product A-series of high-power grid simulator, including installation operations, electrical connection instruction, please read and understand this manual carefully before using the equipment, and pay attention to safety information and operating specifications.



2 Introduction

2.1 Product introduction

AGS A series of power grid simulator is high-precision, high-dynamic, highstandard and the power supplies with comprehensive power grid characteristics. It can perform grid adaptability tests for equipment connected to the power grid and output stable voltages and frequencies. It can also provide a power supply environment with voltage changes, frequency changes, harmonics, inter-harmonics, unbalances, flickers and other power qualityrelated characteristics.

In addition to providing a power supply environment for electrical equipment, the power supply can also receive the energy returned from load and feed it back to the power grid for saving energy and improving the test environment.

2.2 System structure

The grid simulator principle diagram is shown in the figure2-1, the power grid simulator uses a two-way flow topology of energy. It is able to provide load energy and can absorb it as well.

The power grid simulator is divided into rectifier and inverter parts, the rectifier provides a stable DC bus voltage for the rear-stage inverter, the inverter adopts a three-phase independently controlled topology and outputs



the DC voltage to a three-phase AC voltage through three single-phase inverts and three single-phase isolated transformer.

The RMS value, frequency and phase of the output three-phase voltage can be adjusted independently. By adjusting the RMS value, frequency and phase of the power output phase voltage, the normal and abnormal characteristics of the power grid are simulated.



Figure 2-1 Schematic diagram

2.3 Product features

• High precision: voltage accuracy ± 0.1% F.S. and frequency accuracy 0.01% (customized)

• High dynamics: 10%-90% rising time is less than 1ms

• High standards: harmonics, inter-harmonics, fault ride through etc. are higher than the standard test requirements of South Africa, Germany and the United Kingdom

• Comprehensive simulation: full-range adjustment of three-phase voltage, three-phase phase and frequency, harmonics, inter-harmonics, unbalances,



flickers, fault ride through to meet international standards, able to trigger by time and phase angle

• Able to simulate voltage harmonics, inter-harmonic, superimposition with 2-50 harmonic, harmonic phase angle can be set and able to superimposed 1Hz-3000Hz Inter-harmonic

• The same model can be used to install in parallel to improve the output capacity and expand capacity.

• Output synchronous signal to accurately catch the changes and the trigger mode is optional

• Able to do low voltage ride through, high voltage ride through and high/low voltage ride through. A, B, C three phases configurable and trigger phase angle can be set to meet international regulations like VDE-AR-N 4105, NRS 097-2-1, G83, EN50438

• Multiple communication interfaces: RS485/LAN/CAN



3 Product function

3.1 Function description

A series grid simulator can be used not only as a power supply, but also as a load, and will be set according to the contract content before leaving the factory. The basic functions are described as follows:

Source mode

Function	Description
Basic functions	The main interface can make the power supply simulate normal and abnormal characteristics of public grid through the output voltage, frequency, phase and other parameters of the power supply. The three- phase output of the power supply is independently configurable, and the output voltage and frequency can set the slope of change. Electrical parameters can be adjusted in a real-time.
Harmonic injection	Output the distortion voltage waveform by setting parameters such as harmonic frequency and harmonic content.
Inter- harmonic injection	Output the distortion voltage waveform by setting parameters such as the number of harmonics and the content of harmonics between them.
Transient programmi ng	The output voltage is programmable through parameters, including List, Pulse and Step
Flicker	Able to output flicker function
Three- phase unbalance	Able to output three-phase unbalance function





Load mode

Function	Description
Basic functions	The main interface can set the output current, frequency, phase and other parameters of the load. The three-phase output of the power supply is independently adjustable, and the output current and frequency can set the slope of change. Electrical parameters can be adjusted online.
Harmonic injection	Output the distorted current waveform by setting parameters such as harmonic frequency and harmonic content.
Transient programming List	By setting parameters, the output current is programmable step by step.
User-defined waveform	Customization editing output waveform

Source & sink mode

Devices with source & sink mode can configure the required functions in the parameter configuration interface.

The above are 3 general functions introduction, users can find the functions in detail in section 4.3



4 Software introduction

4.1 Initiation

For installation steps and initiation, please refer to the "Installation Manual"

4.2 Software notification

4.2.1 Data source

The data from operation, working status, and fault alarm information of grid simulator are actively uploaded by the controller.

The user can change the operating parameters of grid simulator through the setting interface.

4.2.2 Function description

The main functions of the host computer are as follows:

1 、 Real-time monitoring of the power grid simulator working status, operation data, and fault alarm status

- 2、Storage of the power grid simulator fault alarm status
- 3、The HMI is fully controlled by grid simulator



4.2.3 Introduction of HMI

The main interface of the grid simulator host computer is shown in the figure 4-1.(The figure below is for example, and the interface of different models is slightly different). When initiated for the first time, it defaults to the steady-state parameter page. The whole page is divided into the following parts:

Number	Name	Description
1	Operation and status bar	For the basic start & stop & reset of the rectifier
2	Option bar	Function switching selection and basic settings
3	Status bar	To check the current status of each part of the power supply
4	Output operation bar	For switching on/off the power output and output rest, etc.
5	Given window	Setting and executing of given data commands
Middle	Desktop	Real-time monitoring of actual output parameters such as voltage, current, frequency, power, etc.



Figure 4-1 Grid simulator host computer HMI



To confirm the current status right after the device is turned on, as shown in the figure 4-2

ltems	Functions
System status	 Five category to show the working status of the device: shutdown, standby, operation, reset and fault 1) Shutdown: it means that the equipment is trouble-free and does not work 2) Standby: indicates that the rectifier is on and the output switch is off 3) Operation: indicates that the output switch is on and the output is normal; 4) Reset: reset can be restored to standby. When the failure is investigated, the user can click the "power/reset" if they need to return
Commun ication status	 to standby 5) Fault: The current equipment is faulty and has not been reset. "Normal" means that the communication connection is normal, and "fault" indicates that there is communication is disconnected and need to check the display Ethernet interface
Output state	Indicates the status of the output contactor.
Source load mode	Display the current functional mode of the device, which is divided into "Source", "Sink", "Source + sink"
Parallel mode	The equipment parallel mode is divided into two types: full parallel and series-parallel type.
Parallel status	Including handshake waiting, series parallel inconsistency, M Line N Columns information etc.

4.2.4 Parameter setting

The parameter setting before operation is mainly in the advanced settings interface, which needs to be carried out when the power is turned off, as shown



in the following figure: including parallel settings, protection settings, and communication settings.

Name		Functions						
	Parallel pass- through	Enabling and prohibiting						
Parallel setup	Port1	State settings of the device column parallel installation, with stand-alone, host, slave modes						
	Port2	State settings of the device line parallel installation, with stand-alone, host, slave modes						
Protection		 Set the protection edges and protection time for each voltage, current and power 1) Urms: Output voltage RMS protection 2) Uac: Output voltage AC component protection 3) Udc+, Udc-: Output voltage DC component protection 4) Irms: Output current RMS protection 5) P: Total output power protection 6) S: Output apparent power protection 7) Fmax, Fmin: Output frequency edge protection 						
Communi cation settings		Used for local/remote switching and the selection of communication port						
Source & load settings	Load Mode Display only	Select the load type						



导航	▶ 开机	关机美机复位	[4] 放电	刷新	日本	「「			新	统状态: 出状态:	源载模式: 通信状态:故障	并机状态: 并机方式:	② □ 8 - ₽ × ※完和意情
 设备 	信息	稳态参数 谐	版发生	智态List	智态Pulse	暂态Step	间谐波	闪变	三相不平衡	高级设置	故障记录		
	HAC 自木裁数	并机设置											
1	町态List 町本Dulse	第01 主机	端□2 ✓ 主机	~	并机适传 使能	~							
1	智态Step 智波发生												从御
ſ	间谐波	保护设置											
f. S	闪变 二明天 平衡		Urms[V]	Ua	c[V]	Udc+[V]	Udc-[V]		Irms[A]	P[kW]	S[kVA]	Fmax[Hz	z] Fmin[Hz]
7	高级设置	保护阀值	10.5	0		0	0		10.5	10.5	10.5	55	50
2	故障记录	保护时间[ms]	100	0		0	0		3000	100	100	100	100
													确认
		通信设置											
		控制方式	Y										
													确认

Figure 4-2 Grid simulator parameter setting

Han Fan	 文机 复位 	[分] 長 放电 刷新	E	-		系统状态:关机 源载模式 输出状态:输出断开 通信状态	C: 12 5: 正常 X 意志	- JP ×					
记 设备信息	稳态参数	自定义波形 暫态Lis	高级设置 故障记录										
AGS	1 并积级震												
₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	₩□1 单机	✓ 単机 ✓	并机进行 禁止 ~										
高级设置								确认					
故障记录	保护设置												
		Urms[V]	Irms[A]	P[kW]	S[kVA]	Fmax[Hz]	Fmin[Hz]						
	保护阀值	100	10.5	10.5	10.5	50.1	49.9						
	保护时间[ms]	100	100	100	100	100	100						
								确认					
	通信设置												
	IP地址	192 - 168 - 4	0 210 鐵口号 ;	3080 网关 192	- 168 - 40 - 1								
								确认					
	源载设置												
	源低模式 载	☆戦类型 ~ 非线性负载 ~											
								确认					

Figure 4-3 AC load parameter setting

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4.2.5 Menu function

The above system introduces the power supply usage settings. This section briefly introduces the use of common functions of the menu, modules functions see the picture below 4-4

1. Power on: used to start the rectifier and put the power supply in standby mode.

2. Shutdown: used to turn off the rectifier and put the power supply into the shutdown state.

3. Resetting: usually use after troubleshooting, and the software needs to check the status again.

4. Discharge: After the equipment shuts down, it needs to replace the cable manually, finding the faults, repairing the equipment and other situations. Considering safety issues, it needs to click "Discharge" button, the device discharges itself according to the power of the circuit.

5. Refresh: It is used in cases where the interface data update is slow and is not often used.

6. Locking/Unlock: In order to prevent user-set parameters from being wrong operated during the use process, this series of devices has been added "Locking". After clicking the button, the display parameters cannot be set, just for browsing. While clicking "Unlock" the button exits from locked state.

Web: http://www.cnaction.com



4.3 Usage of host computer

4.3.1 Parameters in steady-state

Start the host computer software and you will see the basic operation interface. The basic operation steps are:

1. Start power supply: The parameters are confirmed to be correct, and the power supply can be started.

1) Start the rectifier: Click on the upper left corner "Start" The button power supply will run in the established timing sequence, when the upper right corner "System status" Shows "standby", the next step can be prepared. At this time, only the rectifier is running, and the power supply has no output.

 Output: After the previous step is completed, click "Send out" button as showing in the figure 5-3, when the upper right corner "System status" Show "running", the power supply outputs normally.

3) Output on control: After the power supply completes the normal start- up process, the output voltage will stabilize at the set value, click "Output contact" button, the contactor at the power output will be contacted, and the power supply will begin to provide power to the device under test.

2. Measurement parameters: The monitoring interface displays data such as voltage, current, phase angle, power etc. from the power supply in real time.

3. Stop output: Click "Output disconnected" button, the contactor at the output side will be automatically cut off, and the power supply will stop providing power to the device under test.





4. Power shutdown: Click on the upper left corner "Shut down", the power supply will run in the established timing, when the upper right corner "System status" shows "Shut down" the power supply off.

The following separately introduce the difference of interface parameter settings for each mode.

4.3.1.1 Source mode

When the device is in the source mode, open the software and you can see the following interface. This interface performs the basic operation of the power grid simulator.

	増わお	數 针动List	軒☆Pulse	軒かStep 间流	女 闪立 =	- 相不平衡 高	吸设者 故障记录				
お削		鈔数									
stist.		Urms[V]	ULIV	F[Hz]	Irms[A]	Θ[°]	PF	P[kW]	Q[kVar]	S[kVA]	
なPulse なStep	Ø1	0	0	0	0	0	0	0	0	0	
〒2014 1987万	Ø2	0	0	0	0	0	0	0	0	0	
unax 弦	Ø3	0	0	0	0	0	0	0	0	0	
相不平衡 級设置	Σ							0	0	0	
	輸出	QE						_#1	厳动 〜 ΔC	止弦波	輸出控制
		Uac [V]		O["]		F[]-	1/]		SR[V/ms]		
	Ø1	220		0		50			500		输出
	Ø2	220		240		50			500		停止
	ØJ	220		120		50			500		輸出吸合

Figure 4-5



Setup steps:

1. Output mode selection: three-phase independent or three-phase according to demand;

2. Select the output mode: AC (No DC component), AC+DC (AC current with DC components, DC part can be set).

3. Output waveform: built-in sine wave, square wave, triangle wave and other forms, and can also be stored by user-defined waveform.

4. Output data settings: Set the size, phase, frequency, etc. of the three-phase voltage.

4.3.1.2 sink mode

The load mode has two options: linear load and nonlinear load.

The linear load interface is shown in the following figures:

There are 4 working mode including constant current (CC), constant power (CP), constant resistance (CR), RLC

च सह) лв.	□ ≭₹.	へ [4] ^{東立 法电}	₽ ₩₩	er internet		-			系统状态: 关机 输出状态: 输出断开	源载模式:载 通信状态:正常		
□ 设备信息		稳态参	教育定义演	形 智态List	市設設置 战	庵记录							
AG9 60	i Nadat	1 MEAR											
重要	List		Urms[V]	F[Hz]	Irms[A]	lpeak[A]	lcf	PF	P[kW]	Q[kVar]	S[kVA]		
伊波 白史	物 · w iw This	Ø1	0	0	0	0	0	0	0	0	0		
南湖	allona Maria	Ø2	0	0	0	0	0	0	0	0	0		
194 1 6	वान्यमर	Ø3	0	0	0	0	0	0	0	0	0		
		Σ							0	0	0		
		1 第4日 の1 の2 の3	I (MH)3/22 I (ml)1 R(mC)1 I (ml)1 G71 1000 1 4/2 1000 1 G73 1000 1		U)	Հաղ 1 1		PBがたより() 0~89.98*の50Hz 0~89.98*の50Hz 0~89.98*の50Hz		RLC 〜 「小取なが 〜 R//L//C foi72 foi72 foi71 foi71 foi71 RLC 早上 一			
									N.	• •	而认		

Figure 4-6



1. CC mode

1. Output mode: choose three-phase independent or three-phase according to requirements.

2. Output waveform: built-in sine wave, square wave, triangle wave and other forms, and can also be stored by user-defined waveform.

3. Selection of 0V voltage start-up, usually it is disabled.

4. Output data settings: three-phase current setting, internal resistance, load type, SA (Output current rising speed) etc.

输出i	2置			恒流 ~	三相联动 🗸 正弦波 🗸 使	能0压启动 ~
	la[A]	R[mO]	PF	负载类型	SR[A/ms]	
Ø1	10	1000	1	阻容・イ	1	
Ø2	10	1000	1	阻容 🗸	1	
Ø3	10	1000	1	阻容 🗸	1	

Figure 4-7

2.CP mode

The setting method is similar to the constant current mode. The output method is output according to the given power.

输出;	设置			恒功率 🗸 三相联动 🗸 正弦波 🗸 禁用0压启动 🗸
	S[kVA]	PF	负载类型	SR[kW/ms]
Ø1	10	1	阻容 🗸	1
Ø2	10	1	阻容 🗸	1
Ø3	10	1	阻容 🗸	1

Figure 4-8

3.CR mode





1. Output mode: three-phase independent or three-phase according to requirements

2. Internal resistance value settable

I 输出i	输出设置			恒阻	~	三相联
	R[mΩ]					
Ø1	1000					
Ø2	1000					
Ø3	1000					

Figure 4-9

4. RLC Mode

1. Output mode: three-phase independent or three-phase according to requirements

2. Load connection method: R//L//C, (R//C)+L, (R+L)//C, (R+C)//L, R+L+C

3. Resistance value, capacitor and inductance value settable according to requirements.

输出;	分置				RLC > 三相联动 > R//L//C >
	R[mΩ]	L[uH]	C[uF]	阻抗夹角	o • •
Ø1	1000	1	1	0∠89.98°@50Hz	L
Ø2	1000	1	1	0∠89.98°@50Hz	
Ø3	1000	1	1	0∠89.98°@50Hz	T I
					N o



The nonlinear load interface is shown as follows: Only CC mode and CR mode



Rode Image: Notice Image: Notice	设备信息	稳态参	數 自定义波	形 暂态List	高级设置 故	章记录						
Name Umsky/J F(H2) Imm(A) ippek(A) icf PF P(kV) Q(kVar) S(kVa) Bib/2029 0	 AGS 稳态参数 暂态List 	一測量	参数					25	50110	0/11/ 1		
Bill 2 x887 Bill 2 0	暂态List 谐波发生	01	Urms[V]	F[HZ]	Irms[A]	Ipeak[A]	let	PF	P[KW]	Q[kVar]	S[KVA]	
MMRRUE DOMBINISAR Q2 Q	自定义波形	101	0	0	U	0	U	U	0	0	0	
MARK Ø3 Ø <td>高级设置 故障记录</td> <td>Ø2</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td></td>	高级设置 故障记录	Ø2	0	0	0	0	0	0	0	0	0	
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IalA CF SR[A/ms] Ø1 10 1.414 1 Ø2 10 1.414 1 1 Ø3 10 1.414 1 1		1 输出	设置						恒流	✓ CF Only <> Ξ	相联动 🗸	1 输出控制
Ø1 10 1.414 1 Ø2 10 1.414 1 Ø3 10 1.414 1			la[A]		C	F		SR[A	Vms]			
Ø2 10 1.414 1 Ø3 10 1.414 1		Ø1	10		1	.414		1				
Ø3 10 1.414 1 停止		Ø2	10		1	.414		1				輸出
		Ø3	10		1	.414		1				

Figure 4-11

1.CC mode

1. Output mode: three-phase independent or three-phase according to requirements

2. CF/PF adjustment mode: CF only (crest factor adjustable) PF only (power factor adjustable) BOTH mode (both CF/PF can be set, priority adjustable)

3. Set the output parameters according to the requirements

1 输出设	20		個流 ∨ CF Only ∨ 三相联动 ∨
	la[A]	CF	SR[A/ms]
Ø1	10	1.414	1
Ø2	10	1.414	1
Ø3	10	1.414	1



1输出;	2 m			恒流 ∨ PF Only ∨ 三相联动 ∨
	la[A]	PF	负载类型	SR[A/ms]
Ø1	10	1	阻容 ~	1
Ø2	10	1	問容 ▽	1
Ø3	10	1	阻容 ~	1



2.CP mode

Similar to CC mode. The output power is controllable, and the output setting interface is as follows:

1 输出设	2 m		恒功率 ~ CF Only ~ 三相联动 ~
	S[kVA]	CF	SR[kW/ms]
Ø1	10	1.414	1
Ø2	10	1.414	1
Ø3	10	1.414	1

1 输出;	içini			恒功率 ~ PF Only ~ 三相联动 ~
	S[kVA]	PF	负载类型	SR[kW/ms]
Ø1	10	1	容 ∨	1
Ø2	10	1	阻容 ~	1
Ø3	10	1	阻容 🗸	1

Figure 4-13



4.3.2 Harmonic

The A series grid simulator has the function of outputting harmonics, and the operation interface is shown in the figure 4-13. It capable to output 2~50 times harmonics, each harmonic content can be controlled independently. Users can set up single harmonics and multiple harmonic combinations.

Source mode outputs voltage harmonics, and load mode outputs current harmonics.



Figure 4-14 Grid simulator harmonic injection control interface



Figure 4-15 AC load harmonic injection control interface



1. Parameter setting:

The parameter table can set harmonic injection parameters, including harmonic times, content, phase, and single harmonic content limits 10%, and harmonic superposition content limits 8%.

2. Programming configuration

ltems	Functions
Harmonic trigger	Single: Single trigger and manually Fundamental wave: Automatic
Trigger source	Local software: local without external trigger source External hardware: external trigger with trigger port
Phase number	Three-phase independence/Three-phase
Coupling mode	AC Coupling by default

3. Preview:

After setting the nominal parameters and harmonic parameters, the total harmonic content of the output voltage can be observed in real time, and the preview interface will automatically output a preview waveform consistent with the parameters.

4. Operation

1. Update: Once parameter setting completed, you need to click "Renew" for update;



2. Loading/End: If the programming configuration selects the harmonic trigger output as fundamental, click "Loading" button while the power supply is running, it enters the function curve; click "End", the power exit curve enters nominal parameters.

3.Trigger: If the programming configuration selects the harmonic trigger output as "Single", you need to click "Trigger" manually. After a single trigger the power supply enters nominal parameter operation section automatically.

4. Other operations

ltems	Functions
Importing	Users can import the parameter table (for specific Excel Table) directly imported into the host computer
Export	The set parameters can be exported directly to a specific Excel Tables
Clear data	Delete all set parameters
DST	27 different harmonic waveform built-in, one-click access and easy to use (Φ1, Φ2, Φ3 represents ABC Three phases)
Read	100 example saved, one-click call, the name can be modified
Storage	One-click edition with harmonic data as an example and make it easy to use again



4.3.3 List Programming

Grid simulator source mode and AC load mode both support transient List function, as shown in the figure below.



Figure 4-16 Grid simulator transient List Interface





- 26 -



1.	Program	nming	configuration

Name	Function			
Cycle	The number of cycles of the whole programming steps,			
	maximum1000, 0 Represents an infinite loop			
	"Exit" : After the power supply completes the output			
	according to the configuration, it automatically exits and			
	runs with steady- state parameters.			
	"Hold" : After the power supply completes the output			
End status	according to the configuration, it is automatically kept on			
	the setting parameters of the last step. In this mode, the			
	control system does not detect the cycle number value and			
	stop of the manual setting after only one cycle is			
	completed			
	Choose to enable or disable according to the requirement			
RMS mode	whether the programming is valid for the effective value or			
	not.			
	Single step: Programming data output only 1 step while			
	receive the trigger signal			
	single cycle: Programming data output 1 time while receive			
Trigger output	trigger signal			
	Single: All programming data is output according to the set			
	number of cycle steps while receiving the trigger signal			
	The differences in detail are shown in the figure 4-18.			
	Automatic: The configured data automatically triggered			
Trigger mode	while receives a signal;			
	Single step: the configured data manually clicks to trigger			
	only one step			
Trigger source	Local software or external hardware			
Phase number	Three-phase independent or three-phase, according to the			
selection	requirements			
Programming	Only working with AC load mode, according to CC or CP			
mode	mode			





Figure 4-18

2. Parameter setting (waveform edition)

Step 1: Set basic parameters of each step according to the requirements. The grid simulator is able to set waveform, voltage, phase, frequency etc. AC load needs to select load type and power factor etc.

Step 2: "change time" The process time of change from the previous step to current step

Step 3: "holding time" Duration of programming parameters

Step 4: " repeat number " Number of repeated runs of one-step programming data

Step 5: "Sequence combination" After setting the parameters, it indicates the programming sequence that the programming can call back from the end of this step, for example, set 2 in the sequence 5 sequence combination,



indicating that after the third step is completed, return to the first 3 Step by step continues to run in progress.

Step 6: "Phase angle" "Initial phase enabling" set them as enable and set the value of phase angle, indicating the angle at the beginning of the programming step. If the disable it, the programming can be triggered at any phase angle.

Step 7: Select in the previous step where you need to add a programming order, click "Add" The button can increase the number of sequences. Select the programming sequence you want to delete, click "delete" can reduce the number of the sequence.

Step 8: Preview: The parameter can be observed in real time in the waveform preview interface, and the programming time is also updated in real time.

3. Start programming operations

1. Trigger: After all parameter settings are completed, click on the upper left corner of the interface "Trigger" button, the parameters are sent to the control system.

2. Loading/End: During the normal operation, click "Loading" button, the power supply enters the transient programming mode; click "End", the power exit current curve and enters the nominal standard.

3.



4. Other operations

ltems	Functions									
Importing	Users can import the existing parameter table (for specific Excel Table) directly into the host computer software.									
Export	The parameters can be exported directly to a specific Excel Tables.									
Read	Pre-deposition100An example, convenient one-click "Read" Call, the instance name can be modified									
Storage	One-click the edited harmonic data "Stockpile" become an example and make it easy to call with one click									

List Programming examples

Example 1: Output of the following waveform



Set parameters as following:

19.00												
No.		波形	Uac[V]	Udc[V]	相位[*]	百分比[%]	频率[Hz]	变化时间[s]	保持时间[s]	序列组合	重复次数	相角[°]
	Ø1	正弦波	220	0	0	50						
1	Ø2	正弦波 ~	220	0	240	50	50	0	0.04	0	0	● <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
	Ø3	正弦波 ~	220	0	120	50						U
	Ø1	正弦波	268	0	0	50						
2	Ø2	正弦波	268	0	240	50	50	0	0.04	0	0	× D
	Ø3	正弦波	268	0	120	50						0

Figure 4-20



Output



Figure 4-21

4.3.4 Pulse Programming

Transient pulse programming only works in the grid simulator mode, pulse waveforms can be added to the base wave, as shown below,

→et πe.	□ <i>⇒</i> ₹		5 2.⊅ Biến	102			· · · · · · · · · · · · · · · · · · ·	ana 1931-294 (35/9 编目	₩太: 财太态:	源载模式: 通信状态: 前	升机状态: 章 并机方式:	
□ 设备信息	稳态参	数 新志	List 哲态Pu	ulse ≌##	:Step 问	Hit P	ो ङ् −गा⊼ऱ्स	街 高级设置	故障记录					
 AGS 稳态参数 	加载	803		导入	朝山	误取	(/储	实例: 实例						
₩i#xList	状态													0
哲志Pulse	时间	0	h_0	min 0.	5 s	进度				0 %				
暂态Step	(0)000	-												
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三相不平衡	常時													^
而報送書		波形	Uac[V]	łTK¢[*]	频四四[H2]	们在门								
故障记录	ØI	正张波	10	D										
	02	正弦波	10	240	50	5								
	Ø3	正弦波	10	120										
	脉冲													^
		波形	UaciVI	相位門	颜羽Hz	周期 5	脉(中間)图(s)							
	Ø1	正弦波	10	0										
	Ø2 Ø2	山奴波	10	240	50	0.5	0.02							
	03	11 164.05	10	120										

Picture 4-22

Parameter editing instructions and usage steps refer to section 4.3.3, here are some examples of programming:



Pulse Programming examples

Required output:

1. Before charging, the oscillation voltage occurs in the following phases: 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°. Charge the vehicle and check the charging status.





Set parameters to the phase angle 0° as an example, changing the trigger phase angle in the graph can change the angle at which the pulse occurs.

~ 基波								
	波形	Uac[V]	Udc[V]	相位[°]	百分比[%]	频率[Hz]	相角[°]	
Ø1		220	0	0	50			
Ø2		220	0	240	50	50	O	
Ø3		220	0	120	50			
^ 脉冲								
	波形	Uac[V]	Udc[V]	相角[°]	百分比[%]	频率[Hz]	周期[s]	脉宽[s]
Ø1		110	C	0	0			
30 <u>)5</u> G		110	0	240	0	800	0.04	0.002
CAME	RA	110	0	120	0			

Pi 4-24



Output





4.3.5 Step Programming

Pulse programming only works under the grid simulator mode, it can be increased in a fixed increase or smaller output voltage, output frequency, etc., as shown below.

≣ ⊳ ∋на πи.												
□ 设备信息	隐态参数 新点Ust 新点Pulse 新会Step 间阱波 闪变 一们不平衡 高级设置 从编记录											
C AGS 段本公封	加較 総然 壯東 导入 导山 读取 化体 实例 注例 1											
₩idsList	状态 ^											
暫志Pulse 暫态Step	山间 0 h 0 min 0 s 洪廣 0 %											
谱过发中	SHPADIA	~										
间消费 (Agas												
三相不平衡	(Ref)	~										
「「吸い」」 故障に見	B-lia(s)											
	Í											
	⁽³⁾ ID542W 10 10 0 0											
	Ø2 <u>Ⅲ322</u> ₩ 10 10 0 50 50 0 240 0											
	23 TT75212 10 10 0 120											





Parameter editing instructions and steps refer to section 4.3.3, here are some examples of programming:

Step Programming examples

Follow these steps to set up the transient step test:

- 1. Set the AC start from 100V and end with 250V, Increments 50V
- 2. Set time 0.08s, and number of loops with 3
- 3. Start the power supply on the main interface
- 4. Click load and trigger on the interface

Output





4.3.6 Inter-harmonic

The inter-harmonic injection function of grid simulator supports output 1Hz~2500 Hz. The operation interface of inter-harmonic injection is shown in the figure below. The operation methods of inter-harmonic injection is generally same as harmonic injection.



鼻航	▶ <i>开</i> 析,	○ ○ ○ ○ 系统状态: ··· 源默模式: ··· 并机状态: ··· ★初 友前 副素 報告 報告 ●	×
 · · · · · · · · · · · · · · · · · · ·	宿息	稳态参数 谐波发生 警态List 警态Pulse 智态Step 间路波 闪变 二相个半衡 高级设置 故赠记录	
	FHAC	加載 総法	
	稳态参数 新大List	编程配置 /	-
	暂态Pulse	福小次数 印版政策左編出 親友復式 戴友旗 相数选择 務合方式	
	暂态Step	1 单次 · 自动 · 本地软件 · 三相独立 · AC	
	谐波发生 间		
	闪变	列表 /	*
	三相不平衡		
	高级设置 故渡记录		

Figure 4-28 Inter-harmonic injection control interface

1. Programming settings

1. In the inter-harmonic injection interface, you can choose the inter-harmonic parameters to be output by the power supply, the inter-harmonic content, the inter-harmonic starting and ending frequency, inter-harmonic step length, execution time, interval time, etc.

2. Select in the previous step where you need to add a programming order, click "Add" The button can increase the number of sequences. Select the programming sequence you want to delete, click "delete" can reduce the number of the sequence.

3. Number of cycles: Maximum cycle 1000 times.

2. Operation:



1. Trigger: After all parameter settings are completed, click on the upper left corner of the interface "Trigger" button, the parameters are sent to the control system.

2. Loading/End: If the programming configuration selects the harmonic trigger output as fundamental, click "Loading" button while the power supply is running, it enters the function curve; click "End", the power exit curve enters nominal parameters.

3. Import and export: The parameters can be exported directly to a specific excel form and the user can import existing parameter table (for specific excel table) directly into the host computer.

Set up the inter-harmonic test according to the following instruction below:

• Inter-harmonic content 20%, frequency start from600Hz and end with 800Hz, step length 200Hz,

- Execution 0.02s, interval 0.02s
- The inter-harmonic interface and scope waveform are shown as following: (The scope only shows A Phase waveform)



Figure 4-29


4.3.7 Flicker

The flicker interface of the grid simulator is shown below. Users can set different nominal parameters and flicker levels (Range of options 1~10), the interface supports waveform preview function, steps as following:

1. Set the flash level: The waveform preview interface is updated in real time according to the settings.

- 2. Set RMS mode and the number of loops
- 3. Trigger
- 4.Loading/End

导航 开标, 普	○ [分] [分] [→	テ 1000000000000000000000000000000000000		系统状态: 输出状态:	源载模式: 并机状态: 通信状态: 故障 并机方式:	
🗔 设备信息	稳态参数 谐波发生 暫态List	暫态Pulse 暫态Step	间谐波 闪变	二相不平衡 高级设置	故障记录	
 FHAC 總态参数 	加载 触发 结束					
暂态List	编程配置					^
暫态Pulse 暫态Step	问变等级 有效值使式 Level1 v 自动 v	循环次数 1				
谐波发生	波形预览					^
间嗜波			闪变头	验预览图		
内变						100
高级设置	100					80 - Va
故璋记录	50					전 - Vb
	0 10	20	80 40 时间[5	50	60 70	80

Figure 4-30



4.3.8 Three-phase unbalance

The three-phase unbalanced control interface of the grid simulator is shown below.

Built-in three standards Class1/2/3 according to IEC61000-427, each Class corresponds to different programming data, the data is standard and fixed, and cannot be edited. "Unbalance factor", "Duration time" and "phase angle" etc. can be edited.

In addition to the above criteria, the three-phase unbalance can be customized. ClassX is an unbalanced custom test, which is also based on IEC61000-427 regulation, but parameters can be edited as user-defined, with the unbalance factor switch open, the unbalance factors in the list are editable. However, the other three-phase voltage parameters are not editable.

After shut it down the unbalance factor then cannot be edited, and other parameters are set freely. After the setting is completed and loaded, then execute the trigger.

导航	▶ 开机	关机 割	入 [4] 1位 放电	刷新 物				A N	系统状态:) 創出状态: i	原载模式: 通信状态:故障	并机状 并机方	ی: 🤇	I &	
- 设备 - F - F - F - F	信息 FHAC 急态参数 督态List 督态Pulse 督态Step	稳态参数 加载 编程配置 循环X3 1	2	暫态List 暫态 東 機式 Class マ 1	Pulse 暫态Ste	p 间谐波	闪变	三相不平衡	高级设置	故障记录				^
1	皆波发生 间谐波 闪变 三相不平衡	列表 No. 1	A相电压占比[%] 100	B相电压占比[%] 90	C相电压占比[%] 95.2	A相相角[°] 0	B相相角[°] 240	C相相角[°] 125	不平衡因子[%] 5.95	持续时间[s] 0	相角[°] 10	起始相位使能 (开)	触发使能 (开)	^
2	奇级设 <u>置</u> 故随记录													

Figure 4-31



4.3.9 User-defined waveform

User-defined waveform mode is available in AC load mode, indicating that the output waveform can be customized. As shown in the figure below, it has editing interface and waveform selection interface.

The programming steps are as follows:

1. Choose one custom waveform number

2. Select the waveform type in the configuration options, such as built-in sine wave, triangle wave, etc.

3. Click edit Waveform to edit or import edited waveform data

4. Download the waveform and store the edited waveform into the selected number

5. Waveform selection interface: For loaded waveform A, B or C (ABC does not represent the three-phase)

6. In List Interface selection waveform A, B or C and able to output a custom waveform.

■	〇 〇 〇 〇 ○ 系統状态: ··· 源軟模式: 火机 夏位 放电 刷新 402 解极 输出状态: ··· 通信状态:	井矶状态: 2 1 8 - J × 故障 井矶方式: X 第二日 本
- 设备信息	稳态参数 谐波发生 暂态List 自定义波形 高级设置 故障记录	
- FHAC	波形進繹 波形选择	
穆态参数 暂态List 谐波发生	自定义波形编号 USER19 下载波形 编辑波形 导入 导出	
高级设置	配置 4	
故障记录		
	波形	^
	1.5	
	1	
	0.5	
	0 ¹¹	





导航	▶	 へ 关机 第位 放电 	副新 锁定	気	系统状态	5: 源载模式: 5: 通信状态: 故障	并机状态: 升机方式:	
□ 设备	信息	稳态参数 增波发生	暫态List 目定义波形	尚级设置 故障记录				
	FHAC	波形编辑	波形选择					
,	想念夢剣 智态List	配置						~
i	谐波发生 高级设置	波形A USER04 ~	波形图 USER01 ~	波形C USER07 ~				
l	故障记录	波形						^
			波形A		波形B		波形C	
		1.5		1.5		1.5		
		1		1		1		
		0.5		0.5		0.5		
		0		0		0		
		-0.5		-0.5		-0.5		
		15		-1		15		
		0	0.5	1 0	0.5	1 0	0.5	1

Figure 4-33 Waveform selection interface

Custom waveform programming examples







Required output

Programming threads

Export the harmonic data first, and save the exported data into waveform A in the custom waveform interface, then output waveform A in List Programming page.

1. Set the waveform according to the harmonic content and select the export waveform



Fiaure	4-35
· ·gaie	

2. Back to the waveform editing interface, select any wave, select a waveform example, and import the waveform data saved in the first step

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Figure 4-36



3. Click Waveform to select, waveform A Set the example of selecting the second imported waveform



Figure 4-37

4. Select waveform A in list programming page

四 连接	間古目は	1	間恋Pulse	報志	Step	13575	7	(FIRE SAL					
	▷ 开始 □		1 x	腔序列				1-1-1-1-1-1					
▲ 粮志	^ 状态												
	8约问 0 h 0 :	min 0.02 s	执行用	啊 0	执行循环	1							
▲ 波形	HR CON	-	-		-		_	100	%				
	A 10 PF												
	- ours												
	福环次数	10	库状志	有效值	inet								
G	部环232 1	10 12	東秋志 計出 ~	有效值 自动	intest V								
•	都示の型 1 ^ 序列	12	南秋志 1331	有效值	int:								
0	a示3章 1 No.	15 王 波形	≭₩± 1出 ~ Uac[V]	有双键 目动 Udc[V]	HEROLUJ	百分比(%)	熊率[Hz]	交化时间[s]	\$215@ji@][s]	序列组合	重双次数	12A(')	50
3	日本 日本 1 へ 序列 No. 01	55 3 3 3 3 3 5 7 6 4	電好畫 [出 ~ Uac[V] 311	有双语 自动 Udc[V] 0	HESC ~	百分比(%) 0	禁率[Hz]	交代2010月[5]	(\$235@1[0][s]	#Place	Eucer	45A(")	80
•	日本 日本 1 へ 序列 No. 21 1 日 21 日 2	55 注 波形 波形A	電社会 2013 Uac[V] 311 311	有效值 目动 Udc[V] 0 0	HE:C ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	FiStk(%) 0 0	续率[Hz] 50	ত্র ধিয়াল্য[s]	(215ette)[s]	18-7000 C	Exar	他和["] ●开	90 +

Figure 4-38



Figure 4-39



5 LCD instruction

Functions and applications

The AGS display interface is divided into 7 Parts, as shown in the figure 5-1.





5.1Launch interface

After powered on the device, start the interface and then jump to the main interface. The startup interface is shown in the figure 1.1_1.



Picture1.1_1 Launch interface



5.2Main interface

The main interface is shown in figure1.2_1, it is divided into the 5 regions: status display area, output display area, menu operation area, output settings area, output control area, different areas can achieve different functions, and users can quickly obtain the information they need in these interfaces.



Picture1.2_1 Main interface area division map

5.2.1Status display area

The status display area at the top of the screen indicates AGS working status and mode, as shown in the figure 1.2.1_1, see the details in table 1.2.1_1 Status function table.



Figure 1.2.1_1 Status display area map

Table 1.2.1_1 Status function table



Status area	Content	Definition and application					
	AC	Source Mode.					
Power	Source						
mode	AC	Load Mode.					
	Load						
	Shut down	Shutdown status, white "shut down" sign not flashing					
Power	Stand by	Standby mode, white "standby" sign not flashing					
supply	Run	Running mode, white "Run" sign not flashing					
status/p rogram ming	Fault	ault status, red "Fault" sign flashing. Click to view the fault ecord (the fault record is not saved when the power goes down), See the picture1.2.1_2 Faulty pop-up window interface.					
status	Reset	Reset mode, white "Reset" sign not flashing					
	Progra m status	Programming status, the current programming status showing with scrolling status					
_	LCD	LCD control mode, white LCD sign not flashing					
Remote	LAN	Remote LAN mode, white "LAN" sign not flashing					
mode	RS485	Remote RS485 mode, white "RS485" sign not flashing					
mode	CAN	Remote CAN mode, white "CAN" sign not flashing					
Contact	On	Source Mode, contactor on. White "On" sign not flashing					
or	Off	Source Mode, contactor off. White "Off" sign not flashing					
status/l oad mode	Load type	Load Mode. White "load type" sign not flashing					
Parallel installat ion status	xRxL	Line x Column x, white "xRxL" sign not flashing, as shown in the figure 1.2.1_3 parallel pop-up interface. Note: After modifying the model parameters with the host computer, you need to click the "parallel" button to update the model parameters. Under 1R1L, the display information as follows, Parallel combination: xSxP (P Parallel number, S Series number)					
		Total power(kW): Xxx.x(Rated power*Series number*Parallel					



		number)			
		Total voltage(V): Xxx.x(Rated voltage*Series number)			
		Total current(A): Xxx.x(Rated current*Parallel number)			
		Number of rows in this column: X (Current number of rows in			
		this column)			
		While 1RnL (N>1), the display information are as follows:			
		Parallel combination xSxP			
		Number of rows in this column:X			
		While nRnL (N>1), the display information are as follows			
		Parallel combination:xSxP			
	Hands	Yellow "handshake" flashing			
	hake				
	SP-	Yellow "SP-ERR" flashing			
	ERR				
	2021-				
Time	06-11	Current time displays			
status	13:29:				
	14				



Figure 1.2.1_2 Faulty pop-up interface



AC Load	关机	本控 断开	1R1L 2022-03-2 16:16:04	4	
Urms(V)					
UII(V)		串并组合	1S1P	\times	
Irms(A)		总功率(kW)	500.0		
At/2)		总电压(V)	500.0		
		总电流(A)	500.0		
5(04)		本列行数	f		
P'F					

Figure 1.2.1_3 Parallel pop-up interface

5.2.2 Output display area

Output display including three parts, the main interface 1 (Source) output display area, main interface 1 (Load) output display area, main interface 2 output display area, and the display content is shown in the table1.2.1_11.2.2_1. Table 1.2.2_1 Output display area table

Output displa	iy area	Display content
	Urms(V)	Voltage RMS value
	UII(V)	Phase voltage
Main interface1	Irms(A)	Current RMS value
(Source)	Θ(°)	Phase
	F(Hz)	Frequency
	PF	Power factor
	Urms(V)	Voltage RMS value
	UII(V)	Phase voltage
	lpeak(A)	Peak current
Main Interface I (Load)	lcf	Peak current factor
	PF	Frequency
	P(KW)	Power factor



	P(KW)	Active power	
	Q(kVar)	Reactive power	
Main interfered	S(kVar)	Reactive power	
Main interface2	ΣP(kW)	Total active power	
	ΣQ(kVar)	Total reactive power	
	ΣS(kVar)	Total apparent power	

AC Source	关机	本控	断开	1R1L	2022-03-24 09:21:02	合			Ξ
Urms(V)	Urms(V) O.OC		0.00	C	3.00		Use 223	t(v)	
UII(V)	0.00		0.00	0	0.00	ss 100		1.00	
Irms(A)	0.00		0.00	C	0.00	95000			
θ(°)	0.0)	0.0		0.0	θSet(°)			
F(Hz)	0.00	00	0.000	C	.000	240.0			
PF	0.00	00	0.000	C	.000	120.0			
						(1)	(3)	R _n	0
		V					~	-	

Figure 1.2.2_1 Main interface1 (Source)

AC Source	关机	本控	线性负	1R1L	2022-03-30 15:48:48	仚			Ξ																				
Urms(V)	rms(V) 0.00		ms(V) <mark>0.00</mark>		0.00		0.00	(3.00		Ise IOC	t(a) 1.00																	
UII(V)	0.00		0.00		I(V) C.CC		v) 0.00		l(V) 0.00		0.00		0.00		0.00		0.00		0.00		(V) 0.00		0.00	C	0.00		100	.00	
Ipeak(A)	0.00		0.00	C	0.00	100.00		.00																					
Icf	0.000		0.000		0.000		0.000	С	.000		PFSet - 0.90																		
F(Hz)	0.00	0	0.000	C	.000	-0.90																							
PF	0.00	o	0.000	o	.000	-0.90																							
		~				Ċ	(R	Q																				

Figure 1.2.2_2



Main inter	face1 (Load)									
	AC Source	关机	本控	断开	1R1L	2022-03-24 09:29:36	窗			Ξ
	P(kW)	0.00	00	0.000	C	.000		Use 225	et(v) 2.00	
	Q(kVar)	0.000		0.000	0.000			25	100	
	S(kVar)	0.00	00	0.000	C	.000		352	00.	
	ΣP(kW)	0.00	00					θSe O.	et(°)	
	ΣQ(kVar)	0.00	00					24	0.0	
	ΣS(kVar)	0.00	00					18	0.0	
							Ċ	3	Q ₀	Q

Figure 1.2.2_3 Main interface2

5.2.3 Menu operation area

The menu operation area is shown in the figure 1.2.3_1 As shown, click a sign under any interface you will enter the main interface and click \equiv sign under any interface you will enter the first-level menu interface, see the picture 1.2.3_2.

Home button⁻



Picture1.2.3_1 Menu operation area diagram

Ŧ×	函数	• >
\odot	设置	>
**	配置	>
	系统	- >

Picture1.2.3_2 first-level menu interface



In remote mode, "Function" under first stage menu, "setup" grey out, the button is disabled;

In running mode, "Config" under first stage menu grey out, the button is disabled.

5.2.4Output setting area

Output parameters can be set in this area.

Different power modes have different setting parameters and settings pages.

See the table 1.2.4_1 for more details.

When setting parameters \leq 2 class, the setting parameters display and settings are completed on the main page;

While 2 Class < setting parameters \leq 4 class, only part of setting parameters are displayed on the home page, the rest of parameter settings will be finished on the main settings page2;

While 4 Class < setting parameters \leq 6 class, only part of setting parameters are displayed on the home page, the rest of parameter settings will be finished on the main settings page1;

Note: linear load RLC After the mode parameters are set, you need to click the OK button to send all the data on this page (if there is data modification, Setting button enabled, and setting button will be disabled after the data is sent), and this data will be sent immediately after the other mode parameters are set.

Power mode	Setting parameters		Setting parameters in home page	Settings page
Source	Licot(\/)	Voltage-	Voltage-	Main
mode	Uset(v)	given	given &	settings

Surface1.2.4_1 Output setting area content table



	SR(V/ms)	Voltage slope rate	phase-given	page2	
	Oset(°)	Phase-given			
	Fset(Hz)	Frequency- given			
Linear load CC	lset(A)	Current- given			
mode(0- voltage	SR(A/ms)	Current slope rate	Gurrent- given & PF	Main settings	
launch is	PFset	PF-given	given	page2	
disabled)	Load type	Load type			
Linear load	lset(A)	Current- given			
CC mode(0-	SR(A/ms)	Current slope rate	Current-	Main	
voltage	PFset	PF-given	given & PF	settings	
launch is	Load type	Load type	given	pager	
enabled)	Rset(mΩ)	Resistance- given			
Linear load	Sset(kVA)	Power-given			
СР	SR(kW/ms)	Power slope		Main	
mode(0-	PFset	PF-given	Power-given	settings	
voltage launch is disabled)	Load type	Load type	& PF given	page2	
Linear load	Sset(kVA)	Power-given			
СР	SR(kW/ms)	Power slope	_		
mode(0-	PFset	PF-given	Power-given	Main	
voltage	Load type	Load type	& PF given	page1	
launch is enabled)	Rset(mΩ)	Resistance- given		Page 1	
Linear load CR mode	Rset(mΩ)	Resistance- given	Resistance- given	Home page	





		-		
Linear load RLC Mode (3 types of	Rset(mΩ)	Resistance- given		
setting parameters	Cset(uF)	Capacitors given		
display RLC Connection method and impedance angle, so you will need to finish on the main settings page1)	Lset(uH)	Inductance given	RLC connections & Impedance Angle	Main settings page1
Nonlinear Ioad	lset(A)	Current- given	Current-	Main
constant current CF	SR(A/ms)	Current slope rate	given & CF given	settings page2
Model	CFset	CF-given		
Nonlinear	lset(A)	Current- given		
load constant	SR(A/ms)	Current slope rate	given & PF	Main settings
Current PF Model	PFset	PF-given	given	pagez
Wodel	Load type	Load type		
Nonlinear	Sset(kVA)	Power slope		
load	SR(kW/ms)	Power slope	Power-given	Main
constant power CF Model	CFset	CF-given	& CF given	settings page2
Nonlinear	Sset(kVA)	Power slope	Power-given	Main



load	SR(A/ms)	Power slope	& PF given	settings
constant	CFset	CF-given		page2
power PF Model	Load type	Load type		

AC Source	关机	本控	断开	1R1L	2022-03-28 16:20:35	企			Ξ	
Urms(V)	0.00		0.00 0.00		Uset 222.	(v) 88	2	SR(V/ms) 100.00		
UII(V)	0.00		0.00		55 roo		100.00		0	
Irms(A)	0.00		0.00		550'00		100.00			
θ(°)	0.00		0.00		θset(°)		Fset(Hz) 50.000		z)	
F(Hz)	0.00	00	0.000		0.045					
PF	0.00	00	0.000							
						Ċ	\oslash	c ₂	Q	

Picture1.2.4_1 Main setting interface2 (Source mode)

AC Source	关机	本控	线性负	1R1L	2022-03-30 15:52:35	仚			Ξ
Urms(V)	0.00		Sset(kVA) 60.00		SR(kW)	SR(kW/ms) 10.00		Rset(mΩ)	
Irms(A)	0.00		60.00		10.00		1000.000		
Ipeak(A)	0.00		60.00		10.00		1000.000		
Icf	0.000		0.000 PFset		负载约	负载类型 阳容			
F(Hz)	0.000		0	.90	阻容				
PF	0.00	0.000 0.90 阻容							
						Ċ	\odot	с _ю	Q

Picture1.2.4_2 Main setting interface1 (Linear load CP mode-0-voltage launch enables)



AC Source	关机	本控	线性负	1R1L	2022-03-30 15:55:12	企			Ξ	
Urms(V)	0.0	c	L E		Rset(r	nΩ) IO	8	Cset(u	F) 310	
Irms(A)	0.00				100	1000		800.000		
Ipeak(A)	0.00		@29	126142	100	1000		800,000		
Icf	0.000		推 15557.8	τ 史角 2 - Θ 1.44	Lset() • 1000.	Lset(uH) 1000.000				
F(Hz)	0.000		5.7822	-8 1.44	° 1000.	1000.000				
PF	0.000		6,7227		• 1000.	1000,000		铺正		
						Ċ	\odot	Ro	0	

Picture1.2.4_3 Main setting interface1 (Linear load RLC Mode

5.2.5Output control area

The output control of the power supply can be completed in this area. The output control button is shown in the figure1.2.5_1, the output button description is shown in the figure1.1.5_2, the button function is detailed in the table1.2.5_1





Picture1.2.5_2 Output control button instruction

Chart1.2.4_1 Output control area button function table



Button Type	Function (Being disabled in remote control mode)
Power-on button	The power supply is shown in blue when it is off, and green in standby mode, blinking display means from off state to standby status (frequency 100ms);
Output/Discharge button	The discharge button is blue when the power supply is off, and click to enter the discharge state, the lights turns to green; The output button is blue when the power supply is in standby mode, and click to enter the discharge state, the lights turns to green; This button is disabled in case of failure.
Contactor button	Blue display when disconnected, green display when connected; Contactor defaults on when at loading mode; This button enables at non-off and non-failure state in source mode, click to switch the contactor state;
Reset button	The non-failure status is displayed in blue, and the fault status is green; The button enables only at fault state, click to reset.

5.3Function

AGS configured with powerful programming functions, which greatly facilitates users to simulate the functional characteristics of various working conditions and equipment. The function function is shown in the figure 1.3_1







Picture1.3_1 Function function tree diagram

Click on the first- level menu "Function" and enter the secondary menu-Functions, see the figure for details 1.3_2.



Picture1.3_2 Secondary menu-Function diagram

When at load mode, the secondary menu function "Inter-harmonic" grey out, the button is disabled.



5.3.1Programming

Click on the secondary menu-Function "Progr" Enter the third menu Programming, see the figure for details1.3.1_1. There are "List", "Pulse", "Step".



Picture1.3.1_2 Third menu-Programming diagram

When at loading mode, the third menu "Pulse" and "Step" grey out, the button is disabled.

5.3.1.1List Program

List Programming has source mode and load mode, each mode corresponding to three interfaces, configuration, data and storage.

List(Source) configuration interface is detailed in the figure 1.3.1.1_1.

List(Source) data interface is detailed in the figure1.31.1_2, button function in

table1.3.1.1_3 . List(Source) storage interface is detailed in the figure1.3.1.1_3 ,

button function table1.3.1.1_4

List(Load) configuration interface is detailed in the figure 1.3.1.1_4.

List(Load) data interface is detailed in the figure 1.3.1.1_5, parameter function in

table1.3.1.1_6 and button function table1.3.1.1_3.

List(Load) storage interface is detailed in the figure 1.3.1.1_6 and button function in table 1.3.1.1_4



AC Source		关机	7	本控	Ē	断开	1R1L	2022- 13:35	03-30 5:02	企		Ξ		
配置	炭		数据		存储				-	 函数		女>编和	₽S	
循环次数														
结束状态		保持	🍢 ì	艮出						Jh.	List			
有效值模式		自动	1	吏能	۲	禁止								
触发输出	۲	单步	单	循环		单次				w	Pul	se		
触发模式	۲	自动	ġ	单步						1.0	Sta	n		
触发源	本	地软件	外言	部硬件						-	JLE	P		
相数选择	Ξ	相独立	┣Ξ材	目联动										
耦合方式	AC		A	C+DC										
										(\mathbf{b})	\bigcirc	Ro	Q	
E.														

Picture1.3.1.1_1 List (Source) Configuration interface

AC Sourc	ce 关	机本	空 断开	1R1L	2022-03-29 10:05:14	仚			
配置		数据	存储			f _×	函数	枚>编	程与
当前序列	1 ,	总序列 1	执行序列	0 循环	次数 0				
	波形	Uac[V]	相位[°]			Лn	List		
Ф1	正弦波	5.00	0.0			L.			
Ф2	正弦波	S.00	240.0			w	Pul	se	
ФЗ	正弦波	S.00	0.051			1.5	Sto	n	
频率[Hz]	50.000	变化时间[s] S.0000	序列组合	0	-	Jie	P	
触发角[°]	10.0	保持时间[s] S.0000	重复次数	0				
起始相位	7 开	关	触发	【 开	关				
加载	触发	添加	删除	上一页	下一页	C		с ^р	0

Picture1.3.1.1_2 List(Source) Data interface

Surface1.3.1.1_3 List Data interface button menu

Button	Function (white display when enabling, grey out when disable)								
Loading	"Loading" button enabling while the device is running, click to								
	load programming data; "Loading" button disabled while the								
	device off, "End" button enables after loading, click to end								
	programming.								
Trigger After loading, the button is enabled, click to trigger programming									
	the button is disabled if the loading unfinished.								
Add	The button enables when total sequence is less than100, click to add								
	sequence, while the button disabled when total sequence is greater								
	than or equal to 100.								
Delete	The button enables when total sequence is greater than1, click to								
	delete; while the button disabled when total sequence is equal to 1.								
Previous	The button enables when current sequence is greater than1, click to								
page	switch to the previous page; while the button disabled when current								
	sequence is equal to 1.								
Next	The button enables when the current sequence is smaller than the								
page	total sequence, click to switch to the next page; while the button								
	disabled when current sequence is equal to the total sequence.								



Picture1.3.1.1_3 List(Source) Storage interface

Surface1.3.1.1_4 Storage Interface Button Function Table

Button	Function (white display when enabling, grey out when disable)
	This button is always enabled, if the case X saved data on the current
Read.	mode, click on it from the case X, and it will read and update the
	current programming data; if the case X did not save the data on the
	current mode, a pop-up window will prompt for failed reading.(X
	Scope from 1-100)
Put in	This button is always enabled to store the current programming data to
	the case X after clicking it.
	(X Scope from 1-100)



Picture1.3.1.1_4 List(Load) Configuration interface

AC Source	ce	关机 z	\$控	线性负	1R1L	2022-03-30 16:00:00	仚	Ξ		
「配置	配置			存储			F _×	函数>编程 🕤		
当前序列		总序列	1	I 执行序列 0 循		次数 0				
	波形	I[A]	Į	力率因数	负载类型	百分比[%]	JA	List		
Ф1	正弦波	10.00	0	1.00	阻容	0.00				
Ф2	正弦波	10.00	5	1.00	阻容	0.00	w	Pulse		
Ф3	正弦波	10.00	9	1.00	阻容	0.00	1.0	Sten		
频率[Hz]	0.00	□ 变化时间	3][s]	S.0000	序列组合	0	-	ыер		
触发角[°]	10.0	保持时间	3[s]	5.0000	重复次数	D				
起始相位	▶ 开	关	1	触发	【 开	关				
加载		え 添力	0				Ċ	0 <mark>%</mark> 0		

Picture1.3.1.1_5 List(Load)Data interface



Surface1.3.1.1_6 ProgramList(Year)Data interface parameter function table

rameters	Functions							
	Xx							
	When the operating mode is CP and PF in priority, I[A] column							
	in data page change to S[kVA] column;							
	When the operating mode is CP and PQ in priority, I[A] column							
	in data page change to P[kW] column, Arrange; The power							
	factor column in data page turns to Q[kVar] column.							
Device	Xx							
factor (Olk)(arl	When the operating mode is CP and PQ is prioritized, the							
lactor./Q[kval]	power factor column in data page turns to Q[kVar] column.							
	Xx							
	The current waveform is a sine wave, 5% Clipping, 10%							
Dorcontago	Clipping, 20% clipping, waveform A, waveform B, waveform C							
Percentage	The percentage cannot be set;							
	The percentage can be set while the current waveform is square							
	wave, trigonal wave and X% clipping.							
Power factor								
	Output frequency;							
Frequency[Hz]	"Frequency" grey out, the button disable, only display							
	function.							



Picture1.3.1.1_6 List(Load) Storage interface



5.3.1.2Pulse Program

Pulse programming has three interfaces that correspond to the source mode, configuration, data, and storage.

Pulse configuration interface is detailed in the figure 1.3.1.2_1.

Pulse (Fundamental wave) data interface is detailed in the figure1.3.1.2_2, Pulse programming (Pulse) data page is detailed in the figure1.3.1.2_3, and button function is in table 1.3.1.2_3.

Pulse storage page is detailed in the picture1.3.1.2_3, button function is in table1.3.1.1_4.



Picture1.3.1.2_1 Pulse Configuration interface



AC Sou	rce 关	、 机 z	本控	断开	1R1L	2022-03-30 11:39:33	仚			Ξ
配置	ĩ	数据		存储			f×	函数	收>编	躍ら
基波										
	波形	Uac[V]	相位[°]			Jh	List		
Φ1	正弦波	5.00		0.0			1.00	Pul	SA	
Ф2	正弦波	5.00		240.0			200	Fui	36	
ФЗ	正弦波	5.00		120.0			5	Ste	р	
频率[Hz]	50.000	触发角[°]]	10.0						
							110	0	~	~
加载	触发					下一页	C	\odot	6	(5

Picture1.3.1.2_2 Pulse (Fundamental wave) data interface

AC Sour	rce 🗦	¢机	本招	图 断开	- 1R1L	2022-03-30 15:17:46	企	ŧ.	Ξ	
配置		数排	居	存值	者		f _×	函数	<>编程℃	
脉冲										
	波形	Ua	c[V]	相位[°]			Jr	List		
Φ1	正弦波		00	0.0			LAA	Dule	0	
Ф2	正弦波		00	240.0				ruis)e	
ФЗ	正弦波		00	150'0			150	Step)	
频率[Hz]	50.000	周期[5]	0.5000	脉宽[s]	0.0200				
							110		-	
加载	触发				上一页		O	\odot	ба (1	2

Picture1.3.1.2_2 Pulse programming (pulse) data interface



Picture 1.3.1.2_3 Pulse Storage interface

Button	Function (white display when enabling, gray display when disable)								
	"Loading" button enabling while the device is running, click to load								
Loading	programming data; "Loading" button disabled while the device off,								
	"End" button enables after loading, click to end programming.								
Trigger	After loading, the button is enabled, click to trigger programming; the								
	button is disabled if the loading unfinished.								
Previou	Pulse interface button enables, click to enter the fundamental wave								
s page	interface, the fundamental wave interface button is disabled.								
Next	The fundamental wave interface button enables, click to enter the pulse								
page	interface; the pulse interface button is disabled.								

Surface1.3.1.2_3 Pulse Data interface button menu

5.3.1.3 Step Program

Step Programming has three interfaces that correspond to the source mode, configuration, data, and storage.

Step configuration interface is detailed in the figure 1.3.1.3_1 .

Step data interface is detailed in the figure 1.3.1.3_2, button function is in table 1.3.1.3_3.







Step storage interface is detailed in the figure 1.3.1.3_3, button function is in table 1.3.1.1_4.

AC Sour	rce	关机	本招	至 断开	1R1L	2022-03-25 19:34:41	企	1. 	Ξ		
配置	1	数	据	存储	i		f _×	函数	函数>编程与		
	波形	AC走	己始[V]	AC结束[V]	AC增量[V]	相位[°]					
Ф1	正弦波	10	0.00	10.00	0.00	0.0	Лn	List			
Ф2	正弦波	t IC	0.00	10.00	0.00	240.0	1.00				
	正弦波	t ic	0.00	10.00	0.00	150.0	w	Pulse			
起始频	[率[Hz]	50.00	00	结束频	[率[Hz] 5	0.000	1.0	Ster	0		
频率增	皆量[Hz]	0.00	0	触发	角[°]	10.0	-	Stel			
步阶时间[s]		1.000	00								
	角虫为						С	\bigcirc	S	Q	

Picture1.3.1.3_2 Step Data interface

Surface1.3.1.3_3 Step Data interface button menu

Button	Function (white display when enabling, grey out when disable)
Loading.	"Loading" button enabling while the device is running, click to load programming data; "Loading" button disabled while the device off, "End" button enables after loading, click to end programming.
Trigger	After loading, the button is enabled, click to trigger programming; the button is disabled if the loading unfinished.
Previous page	AC+DC Mode button enables, click to switch pages; AC Mode button disabled.
Next page	AC+DC Mode button enables, click to switch pages; AC Mode button disabled.





Picture1.3.1.3_3 Step Storage interface

5.3.2Harmonic wave

The source mode and load mode of harmonic programming correspond to three interfaces: configuration, data and storage.

The harmonic programming configuration interface is shown in the figure 1.3. 2_1.

The data interface of harmonic programming is shown in the figure 1.3.2_2, button function is in table 1.3.2_3.

The storage interface of harmonic programming is shown in the figure 1.3.2_3, button function is in table 1.3.1.1_4.



Picture1.3.2_1 Harmonic programming configuration interface - 66 -



AC Source		关机	本控	断	Ŧ	1R1L	2022-03-26 14:29:10	仚			Ξ
西	置	娄	牧据	存	储			f×	函数	攵	5
序列		含量[%]	相位[°]	序列		含量[%]	相位[°]				
	Φ1	0.00	0.0		Φ1	0.00	0.0	~	编程	₽	
2	Ф2	0.00	0.0	3	Ф2	0.00	0.0				
		0.00	0.0		ФЗ	0.00	0.0	\sim	谐波	旻 ·	
í.	Φ1	0.00	0.0		Φ1	0.00	0.0	W	简谐	皆波	
4	Ф2	0.00	0.0	5	Ф2	0.00	0.0				
		0.00	0.0			0.00	0.0				
加载		触发	更新	清空	1	上一页	下一页	Ċ		B	Q

Picture1.3.2_2 Function harmonic programming data interface

Surface 1.3.2 3 Function	harmonic progra	mming data int	terface button	function sheet
_	1 3			

Button	Function (white display when enabling, grey out when disable)
Loading	"Loading" button enabling while the device is running, click to load programming data; "Loading" button disabled while the device off, "End" button enables after loading, click to end programming.
Trigger	After loading, the button is enabled, click to trigger programming; the button is disabled if the loading unfinished.
Renew	After the programming triggers, the button is enabled, click to update the programming data, the button is disabled during non-trigger process.
Clear	This button is always enabled, and the harmonic data clear after clicking
Previous page	The button enables when current page is larger than 1, click to switch to the previous page; The button disabled when current page is equal to 1.
Next page	The button is enabled when the current page is less than the total number of pages, click to switch to the next page; when the current page is equal to the total number of pages, the button is disabled.



AC Source	e 关标	几 本控	断开	1R1L	2022-03-26 14:51:07	仚		Ξ
配置		数据	存储			F ×	函数	- 5
读取	存入	实例				~	编程	
						\sim	谐波	
						w	简谐》	皮
						Ċ	(i) [29 Q

Picture1.3.2_3 Harmonic programming storage interface

5.3.3Inter-harmonic

Inter-harmonic programming only has three interfaces in source mode, corresponding to configuration, data, and storage.

The configuration interface of inter-harmonic programming is shown in the figure 1.3. 3 1.

The data interface of inter-harmonic programming is shown in the figure 1.3.3_2, button function is in table 1.3.3_3.

The inter-function harmonic programming storage interface is shown in the figure 1.3.3_3, button function is in table 1.3.1.1_4.



Picture1.3.3_1 Inter-harmonic configuration interface



AC Sou	rce	关机	本控		断开	1R1L	2022-03-26 14:59:32	仚			Ξ
配記	罿	娄	女据		存储			f _×	函数	攵	
序列	起始频 结束频	率[Hz] 率[Hz]	执行时 间隔时	间[s] 间[s]	步	长[Hz]	含量[%]	-~	编利	呈	
4	50.0	000	5.000	00	S	.000	0.00				
1	60.0	000	1.000	00				\sim	谐》	皮	
2	S0.0	000	5.000	00	S	.000	0.00				
2	50.0	000	1.000	00				w	间记	皆波	
2	50.0	000	5.000	00	s	.000	0.00				
2	60.0	000	1.000	00							
加载	触		添加	# !	除			Ċ	\odot	с _ю	Q

Picture1.3.3_2 Inter-function harmonic data interface

Surface1.3.3_3 Inter-function harmonic programming data interface button function table

Function	Function (white display when enabling, grey out when disable)
Loading	"Loading" button enabling while the device is running, click to load
	programming data; "Loading" button disabled while the device off,
	"End" button enables after loading, click to end programming.
Trigger	After loading, the button is enabled, click to trigger programming; the
	button is disabled if the loading unfinished.
Add	The button enables when total sequence is less than100, click to add
	sequence, while the button disabled when total sequence is greater
	than or equal to 100.
Delete	The button enables when total sequence is greater than1, click to
	delete; while the button disabled when total sequence is equal to 1.
Previous	The button enables when current sequence is greater than1, click to
page	switch to the previous page; while the button disabled when current
	sequence is equal to 1.
Next	The button enables when the current sequence is smaller than the
page	total sequence, click to switch to the next page; while the button
	disabled when current sequence is equal to the total sequence.



AC Sourc	e 关标	机 本控	断开	1R1L	2022-03-26 15:00:21	仚		Ξ
配置		数据	存储			f _×	函数	
读取	存入	实例	1			-~-	编程	
							ゴ両1土	
						\sim	谐波	
						w	间谐》	皮
						Ċ	() ()	20 C

Picture1.3.3_3 Inter-harmonic programming storage interface

5.4Setup

The setting function is shown in the figure 1.4.1, users can set AGS Working mode, parameter setting for each mode, power protection function.



Picture1.4.1 Tree diagram of setup



Click on the first-level menu "Setup" and enter the secondary menu settings, see the picture for details 1.4 2.



Picture1.4_2 Secondary menu of setup

In running mode, secondary menu setup "mode" grey out, the button is disabled.

5.4.1Mode

There are three interfaces under the mode menu: Settings, Source and Load. When the mode is selected as the source mode, it cannot enter the load interface, and when the mode selects load mode, it cannot enter the source interface.

5.4.1.1Setup

The mode setting interface is shown in the figure.1.4.1.1_1, parameter function table 1.4.1.1_1.



Picture1.4.1.1_1 Mode setting interface



Surface1.4.1.1_1 Mode setting interface parameter function table

Parameters	Functions
Mode	Xx When mode selection is "Source", "Load" interface grey out and the button is disabled; when the mode is selected "Load", " Source" interface grey out and the button is disabled.

5.4.1.2Source

The mode source interface is detailed in the figure 1.4.1.2_1, parameter function table 1.4.1.2_1

AC Source	关机	本控	断开	1R1L	2022-03-28 09:49:11	企			Ξ
设置	源		源载		\odot	设置	1		
相数选择	「三相	独立	三相联动			9		12	
耦合方式	A	C	AC+DC			Ð	楔 ェ	C.	
波形	正弦	法				\bigcirc	保护	Þ	
						Ċ	\bigcirc	R	2

Picture1.4.1.2_1 Mode source interface
Parameter	Function
Phase	
number	
Coupling	Xx
mode	When the coupled mode is AC, "AC+DC" grey out, button disabled.
	Xx
Waveform	When the coupled mode is AC, the waveform default as sine wave and
	cannot be set

Surface1.4.1.2_1 Mode Source Interface Parameters Function Table

5.4.1.3Load

The mode loading interface is detailed in the figure 1.4.1.3_1, parameter function table 1.4.1.3_1.

AC Source	关机	本控	线性负	1R1L	2022-03-28 09:49:53	仚			Ξ
设置				载		⊘ 设置		f	
负载类型	【 线性 1	负载	非线性负	载					
输出模式	록 恒流	恒	功率 ′	恒阻	RLC	Ø	模式	Ç	
接线方式	「三相四	「三相四线		三相三线		\bigcirc	保护	5	
相数选择	三相教	使立	【 三相联动						
0压启动	使	能	∽ 禁止						
调节模式	CI		PF						
波形	正弦	波							
负载连接						0	\odot	ця,	0

Picture1.4.1.3_1 Mode loading interface

Surface1.4.1.3_1 Mode	loading interface	parameter function table
-----------------------	-------------------	--------------------------

Parameter	Function
	Xx
0-voltage	Linear load CR mode/ Linear load RLC Mode/ Nonlinear load CC/ CP
start	mode, "Enable" " Disable" grey out, the button is disabled.
	Xx
Adjustme	Linear load CC/ CP/ Linear load CR/ Linear load RLC mode. When
nt mode	mode, "CF", "PF" grey out, button disabled.



	Xx						
Waveform	Linear load CR/ Linear load RLC mode/ Nonlinear load CC/ CP, the						
	waveform type grey out, button disabled.						
	Xx						
Load	Linear load CC/ CP/ Linear load CR/ Nonlinear load CC/ CP, the load						
connectio	connection mode grey out, button disabled.						
n							

5.4.2Protect

The setting protection interface is detailed in the figure 1.4.2 _1.

AC Source	关机	本控	断开	1R1L	2022-03-28 09:50:38	仚		Ξ
保护				- 11		\odot	设置	- 5
	保	护阈值		保护时	前间	-		
Urms[V]	500.0			100)	Ð	模式	
Irms[A]	500.0			100)	\bigcirc	保护	B.
P[kW]		600.0		100)			
S[kVA]		600.0		100)			
Fmax[Hz]		70.0		100)			
Fmin[Hz]		40.0		100)			
						C	Q K	ອ 📿

Picture1.4.2_1 Setup the protection interface

5.5Configuration

Configuration functions are shown in the figure 1.5.1. User can configure AGS Communication mode, parallel function, expansion function.





Picture1.5.1 Tree diagram of configuration

Click on the first level menu "Config" and enter the secondary menu configuration, see the figure for details 1.5 2.



Picture1.5_2 Secondary menu-Configuration diagram

In remote control mode, the secondary menu configuration "parallel" and "Expand" grey out, button disabled.

5.5.1 Communication

Under the communication menu, there are settings, LAN1, LAN2, RS485, CAN, totally five interfaces.



5.5.1.1 Setup

AC Source	关机	本控	断开	1R1L	2022-03-28 10:34:20	仚			Ξ
设置	LAN1	LA	N2	RS485	CAN	4	配置	置	
通讯端口	Scre	en	LAN		RS485	Lot			
	CAN	N				10	迪	fl	
						8-0 0-0	并耶	Ě	
1. v							扩展	民	
						Ċ	\odot	c ²	Q

The communication settings interface is detailed in the figure 1.5.1.1_1

Picture1.5.1.1_1 Communication settings interface

5.5.1.2 LAN

LAN1 communication interface is detailed in the picture1.5.1.2_1, LAN2 interface is detailed in the picture1.5.1.2_2.

AC Source	关机	本	控 と	ī开	1R1I		2022-03-28 10:35:00	企			Ξ
设置	LAN1		LAN2		RS485		CAN	*	配置	Ē	
通讯协议	Modbus	-TCF	Þ								
IP地址	192		168		5		218	10	通话	fl	
子网掩码	255		255		255		0	00	并取	¥	
默认网关	192		168		5		1				
端口号	808	0							扩展	Ę	
										-	
						硝	症	C	\odot	сю	()

Picture1.5.1.2_1 LAN1 Interface



AC Source	关机	本打	空口	新开	1R1	L	2022-03-28 10:35:44	仚			Ξ
设置	LAN1		LAN2		RS485		CAN	-	配置	Ē	
通讯协议	Modbus	-TCP									
IP地址	192		168		5		210		通讯	fl	
子网掩码	255		255		255		0	00	并耶	¥	
默认网关	192		168		5		1				
端口号	808	0							扩展	美	
								21x	Co		0
						研	征	0	0	ß	(2

Picture1.5.1.2_2 News dispatchLAN2 Interface

Note: After setting parameters on the LAN1 and LAN2 interfaces, click the OK button to deliver all data on this page (The button is enabled after data is modified and the button is disabled after the modified data delivered)

5.5.1.3 RS485

RS485 interface is detailed in the picture1.5.1.3_1.

AC Source	关机 本控	断开	1R1L	2022-03-28 10:36:29	仚			Ξ
设置	LAN1 L	.AN2 R	S485	CAN	-	配置	L	
波特率	9600	19200		38400	in the second			
	57600	115200)		16	通讯		
通信地址	1				0.0	并联	17	
C.					0 0 0	扩展	2	
					Ċ	\bigcirc	Ro	Q

Picture1.5.1.3_1 RS485 Interface



5.5.1.4 CAN

AC Source	关机 本打	空 断开	1R1L	2022-03-28 10:37:02	企		Ξ
设置	LAN1	LAN2 R	\$485	CAN		配置	
波特率	125K	250K		500K			
	1000K					通讯	
通信地址					0-0 0-0	并联	
					0 0	扩展	
L.					Ċ	(i) R	n Q

CAN interface is detailed in the picture1.5.1.4_1

Picture1.5.1.4_1 CAN Interface

5.5.2 Parallel installation

The parallel interface is detailed in the figure 1.5.2_1, parameter function table 1.5.2_1

AC Source	关机	本控	断开	1R1L	2022-03-28 10:37:36	仚	企	
并联						-	配置	5
端口1	「 单	机	主机		从机	100		
端口2	「 单	机	主机		从机	161	通讯	
并机透传	● 使	能	禁止			00	并联	
12						0 0 0	扩展	
						Ċ	0	പര

Picture1.5.2_1 Configure the parallel interface



Parameter	Function						
	Xx						
Dort1	When port 2 is master or slave, Port 1 "slave" button grey out,						
Porti	button disabled.						
	Xx						
Port2	When port 1 is master or slave, Port 2 "slave" button grey out,						
	button disabled.						
Parallel	Xx						
pass	When port 1 and port 2 are not single machine, the "performance" in						
through	parallel pass through grey out, button disabled.						

Surface1.5.2_1 Configure the parallel interface parameter menu

5.5.3Expansion

The extended interface is detailed in the figure 1.5.3_1 , parameter function table 1.5.3_1

AC Source	关机	本控	断开	1R1L	2022-03-28 10:38:37	仚		Ξ
补偿						-	配置	
PDU	~ 使	能	禁止					
远端补偿	~ 使	能	禁止			ie.	通讯	
						8-0 0-0	并联	
E.							扩展	
L						Ċ	(i)	29 Q

Picture1.5.3_1 Expansion configuration interface

Surface1.5.2_1 Configure the extended interface parameter function table

Parameter	Function
PDU	
Remote	Xx
compensa	PDU When prohibited, the "enable" button in remote compensation
tion	grey out.



5.6 System

System functions are as shown in the figure 1.6.1, User can configure the display screen information and version number query.



Picture 1.6.1 System tree diagram

Click on the first level menu "System" Enter the secondary menu and see the picture for details 1.6 2.



Picture1.6_2 Secondary menu system diagram

5.6.1 Screen

There are Language, Display, Sound and Timing, totally four interface under screen menu.

5.6.1.1Language

The screen language interface is detailed in the picture1.6.1.1_1



AC Source	关机	本控	断开	1R1L	2022-03-28 13:28:50	企		Ξ
语言	显	示	声音		时间		系统	- 5
语言	~ 中2	文						
							屏幕	
							关于i	设备
						Ċ	() ()	3 Q

Picture1.6.1.1_1 Screen language interface

Surface1.6.1.1_1 Screen Language Interface Parameters Function Table

Parameter	Function
Language	Display language, currently only Chinese is supported

5.6.1.2 Display

The screen display interface is detailed in the picture1.6.1.2_1, parameter function table1.6.1.2_1.



Picture1.6.1.2_1 Screen display interface



Surface1.6.1.2_1 Screen Language Interface Parameters Function Table

Parameter	Function
Brightnes	The brightness of the display, move the slider to adjust the brightness
S	of the display
Screen saver	Set how long you don't touch the display, and it will enter the screen
	lock interface. For example, setting 30s , in 30s If you don't touch the
	screen, you will enter the screen lock interface

5.6.1.3 Sound

The sound interface is detailed in the picture1.6.1.3_1, parameter function table1.6.1.3_1.

AC Source	关机	本控	断开	1R1L	2022-03-28 13:30:15	企		Ξ
语言	显示	示	声音		时间		系统	5
报警音	Ź 关	闭	开启					
触摸音	关	闭 【	开启				屏幕	
开机音	「 关	闭	开启			i	关于设	备
						Ċ	0	5 0

Picture1.6.1.3_1 Screen sound interface

Surface1.6.1.3_1 Screen sound interface parameter function table

Parameter	Function
Alarm sound	The display beeps alarm in case of failure
Touch sound	Display beep prompt every touch
Boot tone	The display beeps when it is turned on



5.6.1.4Time

The screen time interface is detailed in the picture1.6.1.4_1, parameter function table1.6.1.4_1.

AC Source	关机	本控	断开	1R1L	2022-03-28 13:31:06	企		Ξ
语言	显示		声音		时间	88	系统	* 5
日期	2021		4		9			
时间	8		6		1		屏幕	
							关于设	备
								÷
					确定	Ċ	() R	5 Q

Picture1.6.1.4_1 Screen Time interface

Surface1.6.1.3_1 Screen Time Interface Parameters Function Table

Parameter	Function
Date	Set the display date
Time	Set the display time

5.6.2About

The system details interface as shown in the figure 1.6.2_1, parameter function table 1.6.2_1.



AC Source	关机	本控	断开	1R1L	2022-03-28 13:32:05	企		Ξ
软件版本							系统	
HIM	05.	585.22.0	00.01					
HIC	05.	584.21.0	00.01				屏幕	
MON	02.	661.12.0)1.14			i	关于设	备
CTR	05.	591.12.0	01.05					
FPG	07.	236.12.0	01.10					*
						Ċ	() R	5 Q

Picture1.6.2_1 System detail interface

Surface1.6.2_1 Screen Time System About Device Interface Parameters Function Table

Parameter	Function						
	HIM-Display program						
	HIC-Display control program						
Software	MON- Central control M4 Program						
version	CTR- Central control M7 Program						
	FPG-FPGA Program						

5.7 Screen lock interface

If you do not operate the display during the screen lock time, you will jump to the screen lock interface. After clicking anywhere on the screen lock interface, you will jump out of the screen lock interface.





Picture1.7. _1 Screen lock interface

Screen lock interface "Actionpower" Logo will display evry 10s separately on the 4 corner and middle of screen.



6 Maintenance

Due to the influence of environment temperature, humidity, dust and vibration, the inside of grid simulator will be aged, resulting in potential of failure. Therefore, it is necessary to carry out daily and regular maintenance of the grid simulator to ensure its normal operation and service life.

The content of the routine maintenances and the recommended maintenance period are shown in the following table:

	Pariod			
ltems	Methods	renou		
Storage software data	 Read the data of the data collector Save running data, parameters, and logs to a disk or file Check the parameter Settings Software updates 	1 month(depending on the size of system)		
Operating conditions and environmental testing	 Check whether AGS damaged or deformed. Check whether AGS has abnormal sound Check the variables while the system is running. Check the variables while the system is running. Check whether the main components are normal. Check the AGS shell if over-heated, thermal monitor is suggested. Check whether the wind tube is normal. Check the AGS environment humidity and dust, if the operation room inlet filter normal. 	6 months		



	8. Cautions! Outlet ventilation must be checked, the module will be faulty due in the over-heating scenario.	
System cleaning	 Check the circuit board and components for more wet dust accumulation, dirt, moisture and external water seepage, and so on. Check the heat sink temperature and dust. If necessary, shall be used for compressed air and open fan, to clean module. Clean or replace the air filter. Insect protection for clean air inlet and outlet. 	6 months(depending on the quality of environment)
Power circuit connection check	 Check whether the power cable connection is loose and tighten it according to the specified torque. Check whether there is any damage on the power cable, control cable, especially with the metal surface contact if there is a cut trace of the skin. Check whether the insulation wrapping tape of the wiring terminal of the power cable is off. 	6 months after first configuration, 6- 12 months then.
Terminal and wiring connection check	 Check whether the screw of the control terminal is loose and tighten it with a screwdriver. Check the status of main circuit terminal have poor contact, screw position if there is overheating. Visually check device terminal connections and cable distribution. 	12 months
Cooling fan function test	1. Check the functions and running noise of all fans, and check whether the	12 months



	blades are cracked. If you have any			
	abnormal, please change in time.			
	1. Routine inspection of all metal	6 – 12 months		
	components for corrosion.			
	2. Contactor yearly check (auxiliary			
	switch and micro switch) : current			
	breaker electrical leakage, circuit			
Protection	breaker, surge protector, power switch,			
functional test	all the risks and isolating switch,			
	according to lubricating or replacing			
	contactor, to ensure that the machine is			
	in good working status.			
	3. Overheating function test: Check the			
	overheating safety circuit.			
	1. Check warning labels and replace			
Security	them if necessary.			
	2. Check the emergency stop button	Constant in a		
function	and the LCD stop function.	6montns		
detection	3. Shutdown simulation, signal			
	communication check as well.			



1. During maintenance work, metal devices such as screws and gaskets cannot be left in the panel, otherwise the equipment may be damaged and cause unsafe accidents.

2. Before hardware maintenance of the power supply, turn off the front-stage distribution power to ensure that the contact parts is not charged; cut off all auxiliary circuits and wait at least 15 minutes for the circuit capacitor discharge; open the cabinet door and measure the voltage of the input terminal and intermediate circuit terminal to ensure that there is no dangerous voltage before the corresponding operation.

3. Only qualified electrical engineers can perform the work described in this chapter.



7. Troubleshoot

Fault unit and types		Fault analysis	Solutions		
	The LED indicator of "Power" off	AGS power supply is not provided electricity.	Check to ensure that the power supply and connection are normal. Turn off AC and DC voltage and hold for 5 minutes, reconnect the DC and AC voltage. If the light is still not on, please contact us.		
	The LED indicator of "Run" off	AGS power supply is not under the normal running conditions.	Check that the AC and DC cables are correct. Use a multimeter to measure Input voltage to ensure that the voltage not less than starting voltage of the AGS, ensure that the parameters meet the operating requirements. If there is no problem with the above check, and the indicator is still not on, please contact us.		
	The LED indicator of "Fault" on	AGS is faulty, and there is potentially other issues.	Check the detailed fault information on the touch screen and take appropriate troubleshooting measures. If the light still on, please contact us.		
L C D s	lnput over- voltage	Voltage of grid side too high.	Check voltage of grid side, line to line voltage should less than 418V, if the grid side voltage normal and issue continues, please contact us.		
c r e e	Input under- voltage	Voltage of grid side too low.	Check voltage of grid side, line to line voltage should greater than 332V, if the grid side voltage normal and issue continues,		





-			plance contact us
n			please contact us.
:	Inductanc	The inductance	Check the fan on the top of
I	e at grid	connecting to grid side	rectifier cabinet 1#, if the fan
S	side over-	in cabinet 1# is over	normal and issue continues,
S	heat	temperature.	please contact us.
u	Bridge	The rectifier module	Check the fan on the top of
e	inductanc	inductance connecting	rectifier cabinet 1# & 2#, if the
S	e over-	to cabinet 1# & 2# is	fan normal and issue continues,
	heat	over temperature.	please contact us.
	A phase	The temperature of the	Check the fan on top of A-phase
	transform	A-phase inverter	inverter cabinet, if the fan normal
	er over-	transformer is too	and issue continues, please
	heat	high.	contact us.
	B phase		Check the fan on top of B-phase
	transform	The temperature of the	inverter cabinet, if the fan normal
	er over-	B-phase inverter	and issue continues, please
	heat	transformer is too high	contact us.
	C phase		Check the fan on top of C-phase
	transform	The temperature of the	inverter cabinet if the fan normal
	er over-	C-phase inverter	and issue continues please
	heat	transformer is too high	contact us
	Others	Others	
	Others	Others	Check if there is a problem with
	Communi	The display program	the communication color
	cation	on LCD is not	the communication cable
	issues	according to DSP	connection, if the problem is not
			solved, please contact us.
			Check whether the power is
No	oise's too	AGS and transformer	within the normal range, measure
Ιοι	ud during	running abnormal, and	the output current and voltage
ma	achine	the cooling fan is	wave shape, abnormal waveform
ru	nning	faulty.	otten produces a lot of noise.
	5		Check and replace the cooling
			fan if necessary.
Co	ommunication	Communication is not	Please look up at supplement 2
iss	ue with host	following up.	riease look up at supplement 2



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Attachment 1

1.3 Preparation for parallel installation

1) Parallel current sensor sampling line is 2.5mm2 cable, the cable length is configured according to the actual situation;

2) 12 of Parallel optical fiber cable, the cable length is configured according to the situation.

3) Parallel connection drawings——See the attached page

Parallel operation

Cable connection

Parallel current transducer sampling line and parallel optical fiber connection, as shown in the attached picture, complete the connection according to the picture.

Note: The direction of parallel current sampling transducer threading, by P1 Point to P2, which is the direction of the load current; the current transduce sampling line S1 and S2 should strictly follow the diagram for connection.

Display settings

Select from the debugging parameters of the four power supplies "Parallel setup", one of them is set as the host and the other three are set to the slave.



■ ○ 早航 开机	 ・ ・	[4] 放电 刷新	合いの	全 解锁		系	统状态: 源载 出状态: 通信	模式: 并机 :状态:故障 升机	状态:	
□ 设备信息	稳态参数 清	1波发生 暫态	List 目定义波州	高级设置	故障记录					
FHAC	并机设置									
稳态参数 暂态List 谐波发生	端口1 主机	端□2 ✓ 主机	并机透传 ~ 禁止	~						
高级设置										備认
故障记录										
	保护设置									
		Urms[V]	Uac[V]	Udc+[V]	Udc-[V]	Irms[A]	P[kW]	S[kVA]	Fmax[Hz]	Fmin[Hz]
	保护阀值	10.5	0	0	0	10.5	10.5	10.5	55	50
	保护时间[ms]	100	0	0	0	3000	100	100	100	100
										确认
	Ⅰ通信设置									
	控制方式									
										确认





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Attachment 2

Ethernet remote connection instructions

Step 1: Set up remote control on the display, set up IP Address, as shown in the red box below:

🗆 设备信息	总态参数 智态编程 谐波发生	间错波 闪变 相不平衡	高級設置 故障记录			
FHAC 稿态参数	保护设置					
省济航程 讲波发生	Urms[V]	Irms[A]	P[kW]	S[kVA]	[max[1]/]	Emin[Hz]
	保护网值 650	400	400	400	70	50
间诺波 闪变	fkitrifficiums] 100	3000	100	100	100	100
						确认
高級設置						
	単次 一 出版 ~	単次 ~ 日初 ~				确认
	「通信設置					
	Mitterfac 新聞体白 玩程 VIAN V	IP地址 192 168 子体練巧 255 255	40 2 端山 255 0 网义	I목 8080 192 168 4	H0 1	
						mbo (
						140.4

Note: Set IP, it needs to be in the same network segment as the computer where the user's host computer is located.

Step 2: Turn on the host computer and find Config.xml file in Debug file folder,open the file, the changes is as shown below, write the IP address and port number.

Change 1to 0 on the letters "Whether touch screen mode or not". After saving, open the host computer.



🧾 Config.xml - 记事本 文件(F) 编辑(E) 格式(O) 查看(V) 帮助(H) <?xml version="1.0" encoding="utf-8" ?> <Config> <!--APP版本--> <AppVersion>AK05.571_V1.0_B00_D11</AppVersion> <FHAC>1</FHAC> <FHDC>0</FHDC> <!--是否显示恢复出场设置按钮--> <SHowFactoryReset>0</SHowFactoryReset> <!--是否显示直流调试模式--> <SHowDebugPage>1</SHowDebugPage> <! 延时连接时问 > <DelayTime>5000</DelayTime> <!--交流整流器回读时间--> <AcDelayTime>1300</AcDelayTime> <!--是否万触摸屏模式--> <TouchMode>0</TouchMode> <!--是否显示交流调试模式--> <SHowAcDebugPage>0</SHowAcDebugPage> <!--是否显示窗体任务栏--> <ShowWindowBottom>0</ShowWindowBottom> <!--FHDC 单双通道模式0单通道1双通道--> <FHDCCHSelect>0</FHDCCHSelect> <FHACIPAddress>192.168.40.210</FHACIPAddress> <FHACIPPort>8080</FHACIPPort> <FHDCIPAddress1>192.168.40.210</FHDCIPAddress1> <FHDCIPPort1>8080</FHDCIPPort1> <FHDCIPAddress2>192.168.40.211</FHDCIPAddress2> <FHDCIPPort2>8080</FHDCIPPort2> </Config>

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