EEM Software manual

(Version. 1.4.7)

Date: 2020/01/07

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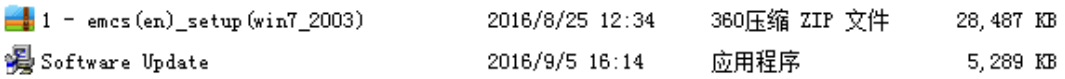
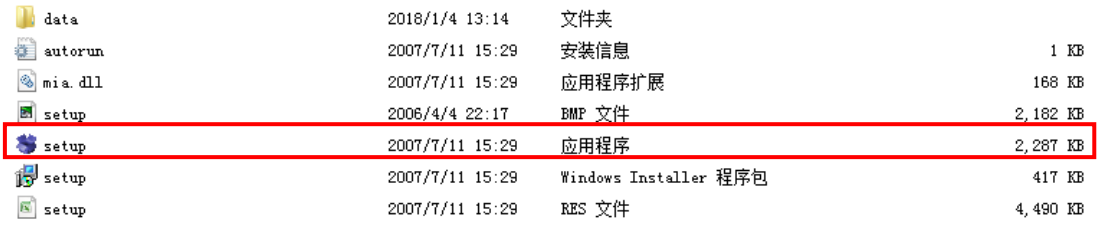
1. Installation and update

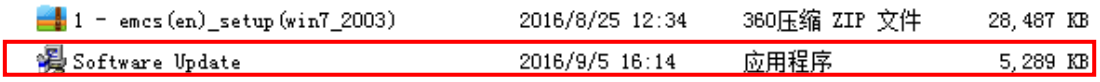
Consist of two file, one is EEM software, another is its update.



Unzip the file before installation



After installation, install the update.

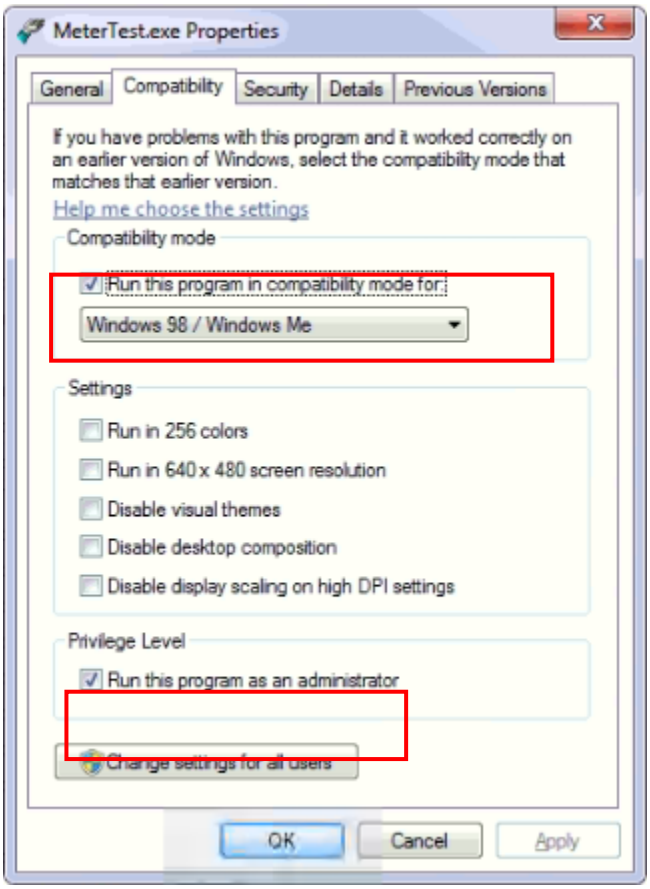


2. Authorization & compatibility

Authorize Metertest.exe to run as administrator mode, set the software to run as compatible with Windows 98.

Metertest.exe is located at the default file part,

C:\Program Files\EEM Calibrator system\geny soft\emcs



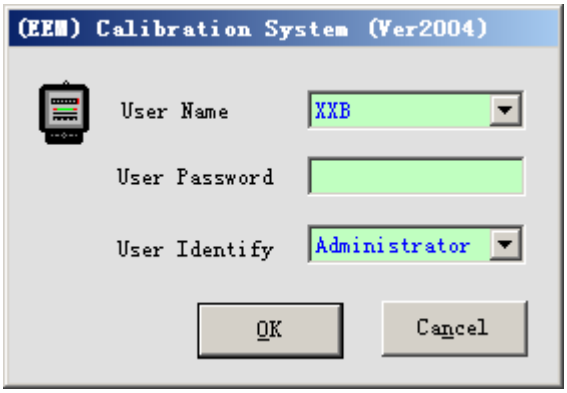
3. Start up the EEM software

   Start EEM software from 'Start EEM' icon on desktop, this is a 'bat' file. It's to program the EEM metertest.exe to run at single CPU environment.

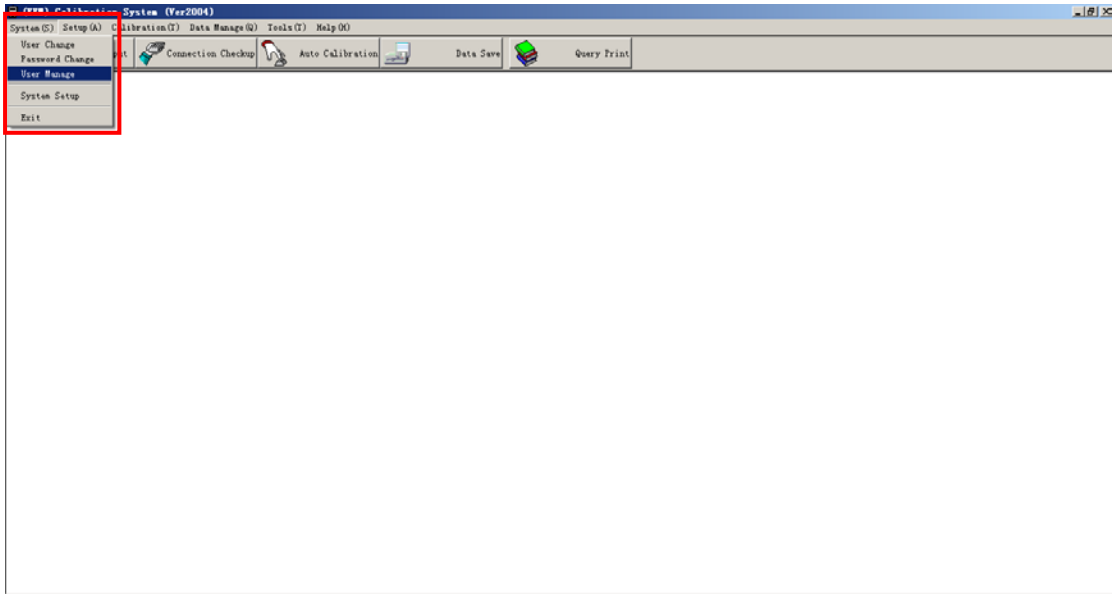
3.1. User log in

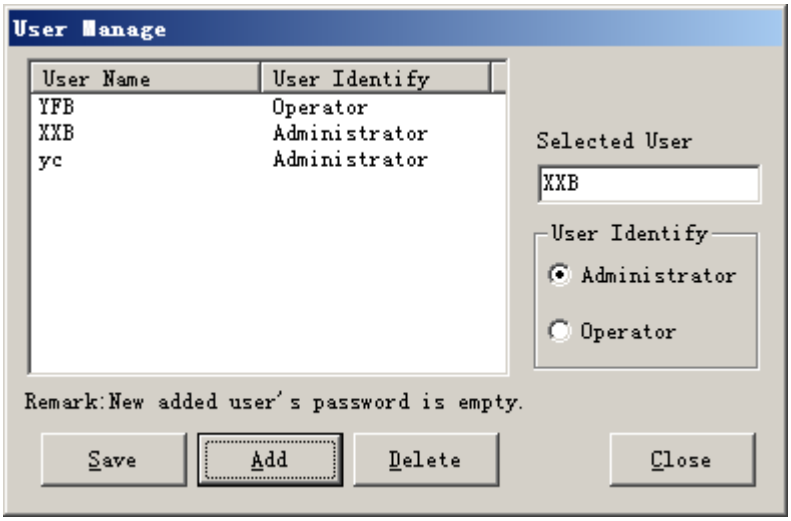
   Account: XXB, Password not required

   Account: Administrator, Password: yckj



3.2. User management



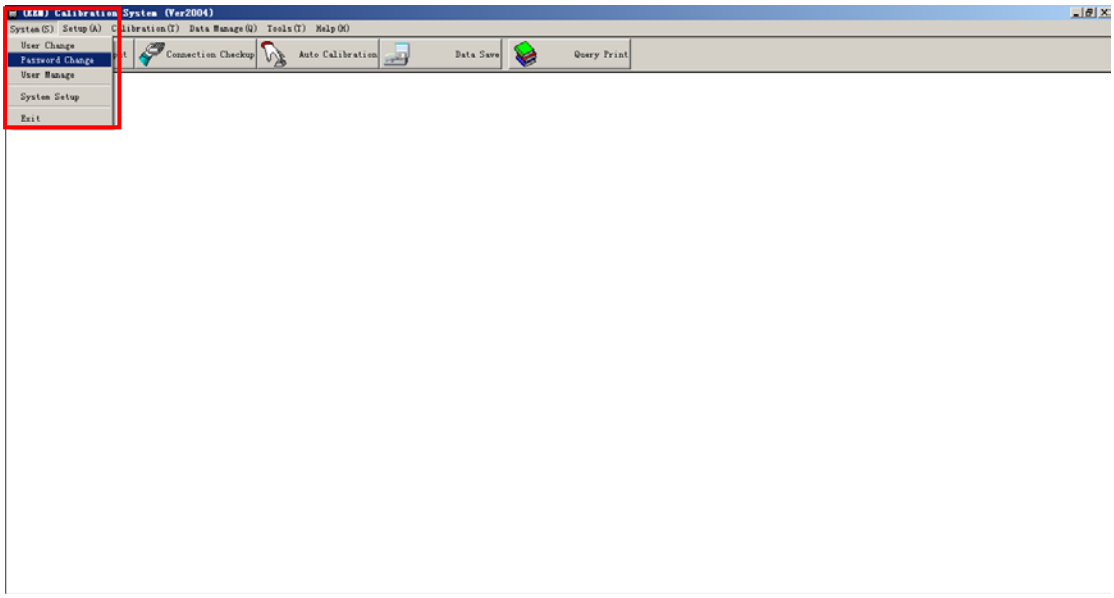


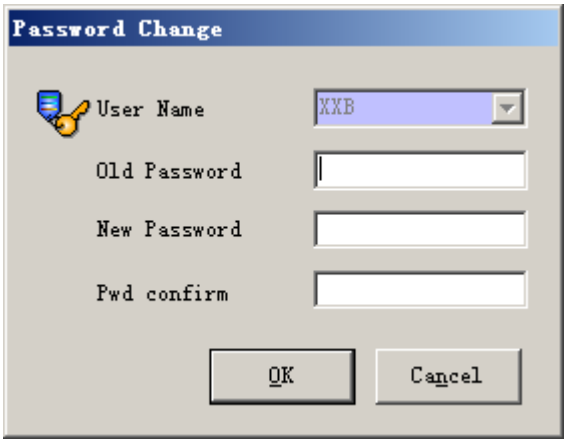
Access:

User	System setup	Calibration project	Meter parameter modify	Save calibration result	Query and print

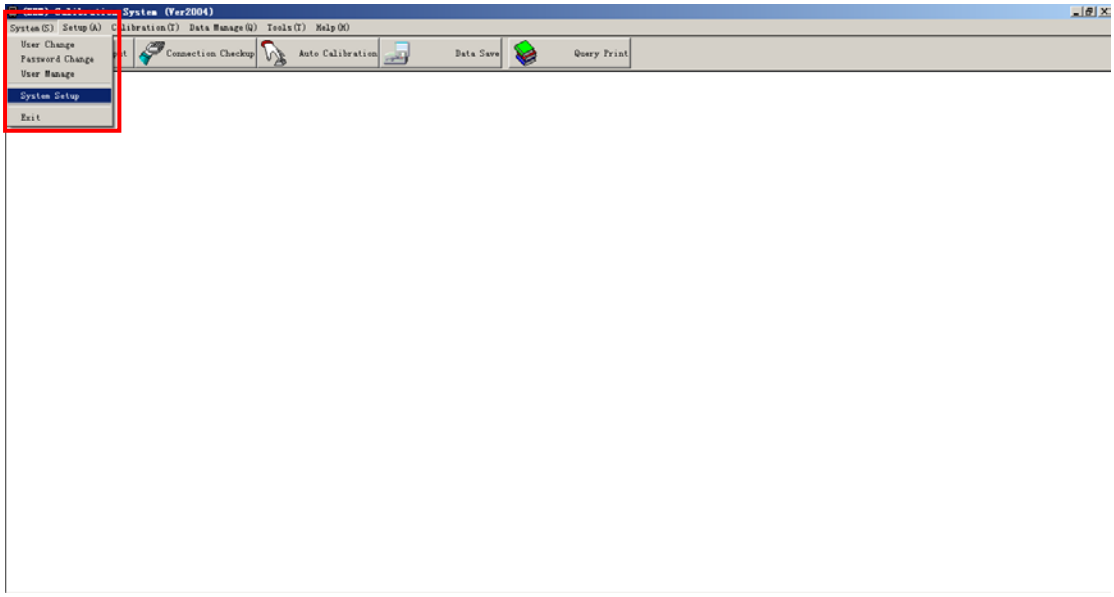
Administrator	√	√	√	√	√
Operator	×	×	×	√	√

3.3. Password change

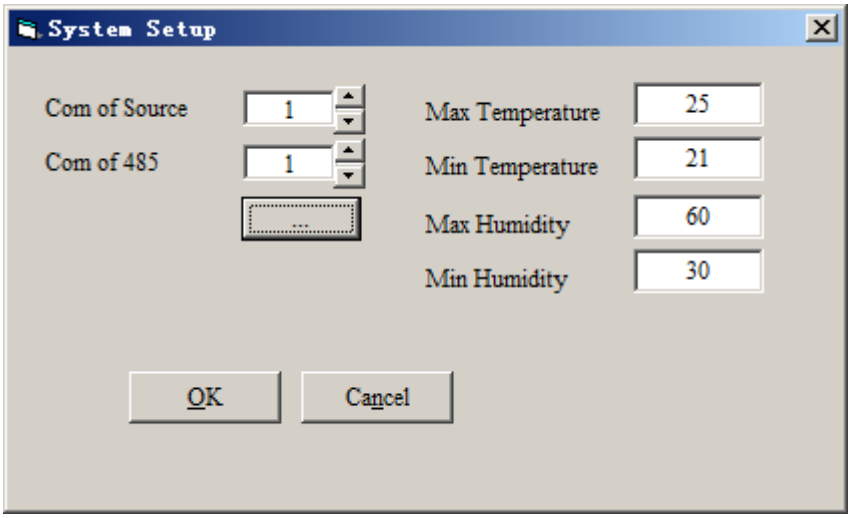


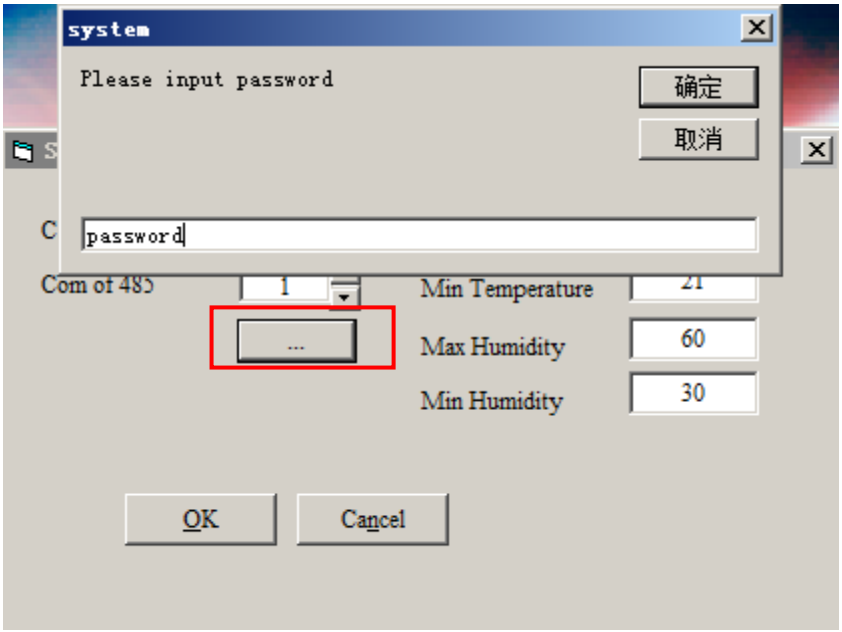


4. System setup



Log in system setup password: password





4.1. Basic info

Device setting : Three phase or

Separate Single out : A(single phase mode use phase A current as test current)

Device serial number: 0317031

Com of source: 1 (depend on the PC hardware setup)

Position: 24(total meter position of test bench)

Option of faster getting result

Option of net type of device

Digital: 4 (decimal place)

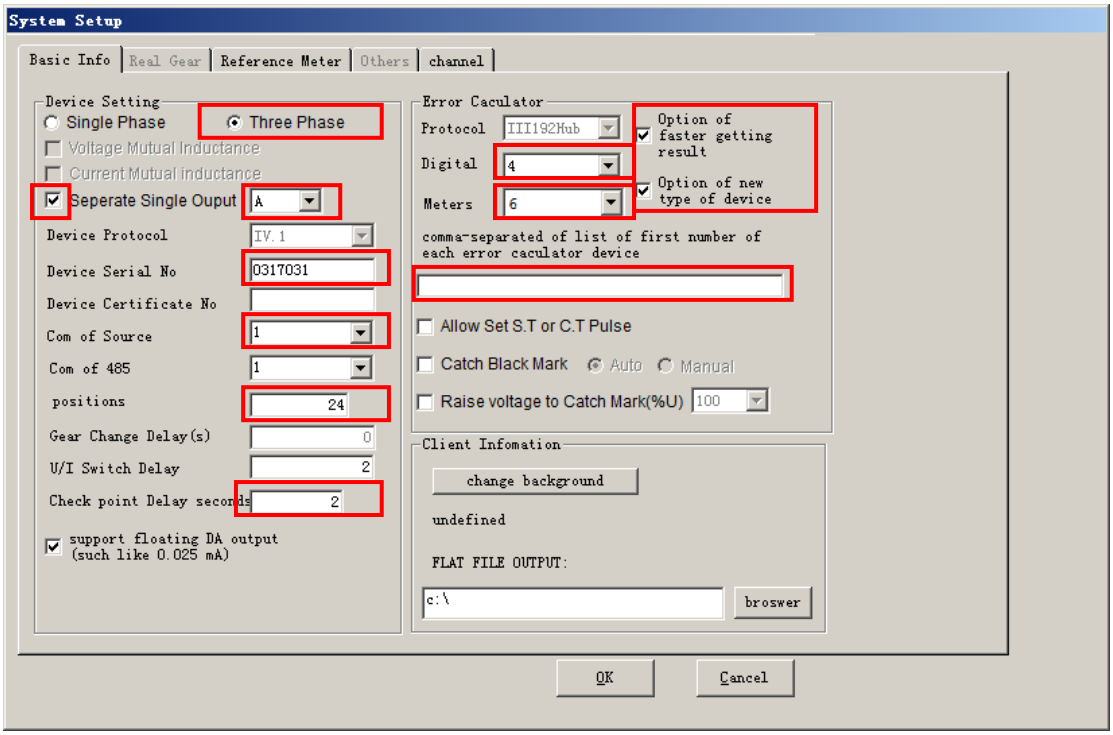
Meter: 6 (6 meters per a error calculator board)

Comma-separated of list of first number of each error calculator device: leave it blank.

(For 24 position test bench with 4 meter position per each error calculator: 1,5,7,13,17,19

)

Check point delay: Delay

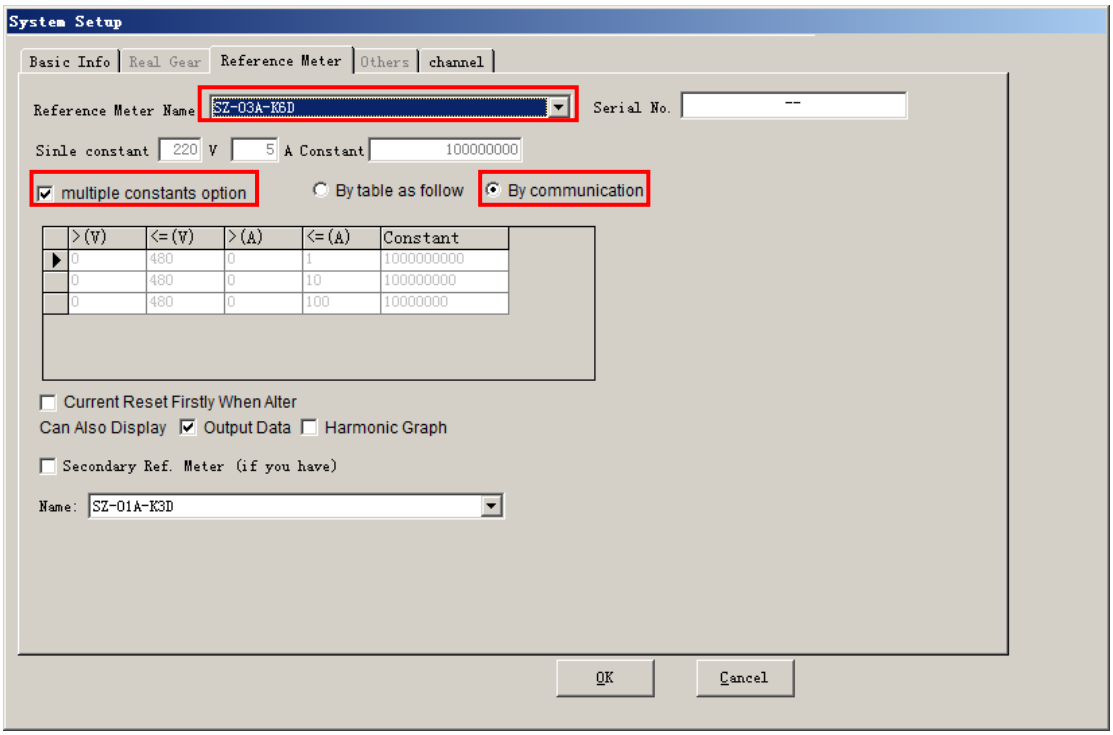


4.2. Reference meter

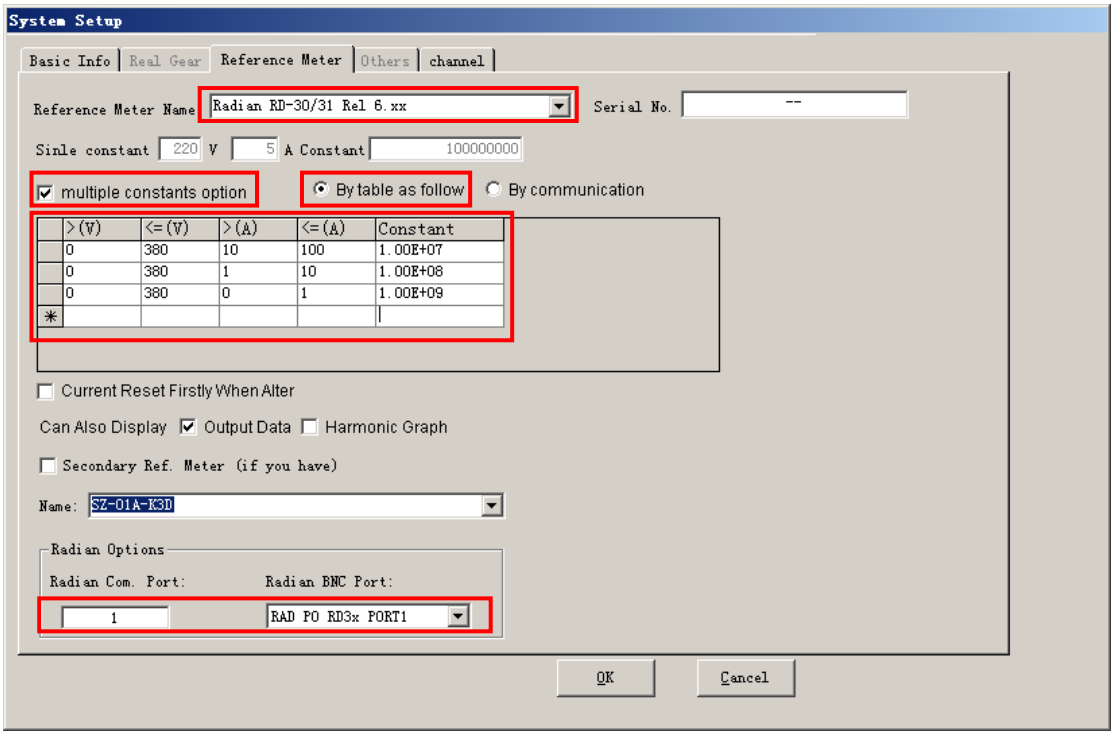
Reference Meter Name SZ-03A-K6D

Multiple constants option

By communication

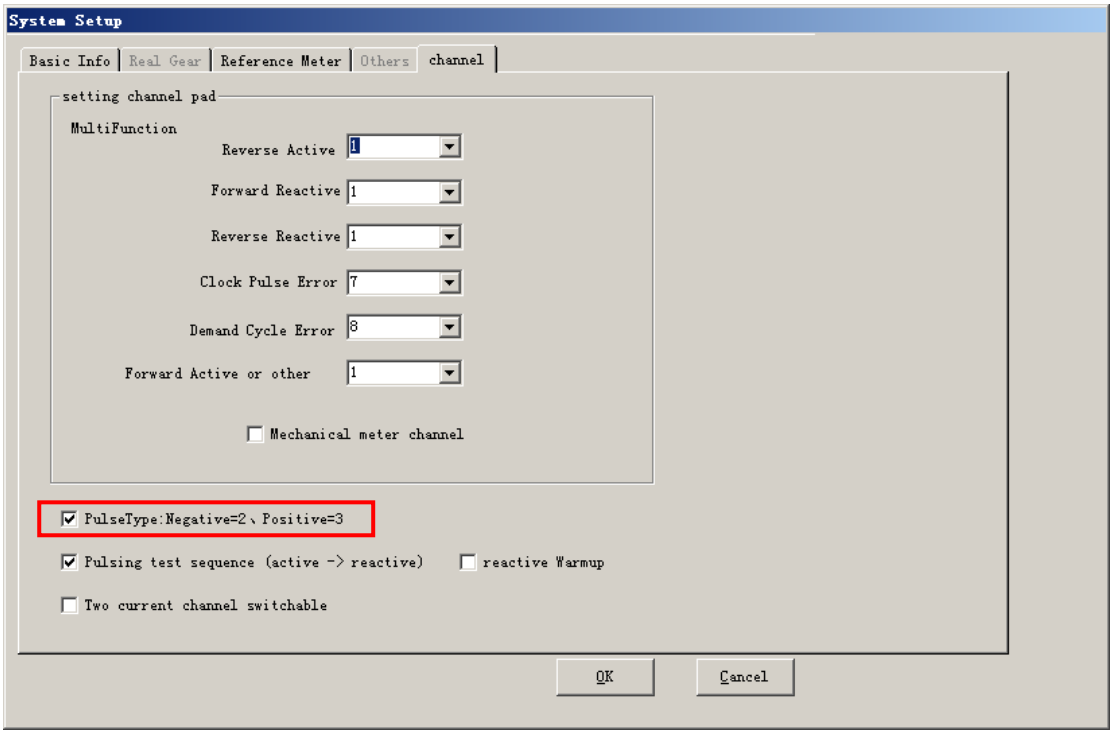


4.3. Reference meter for EDMI (Radian)

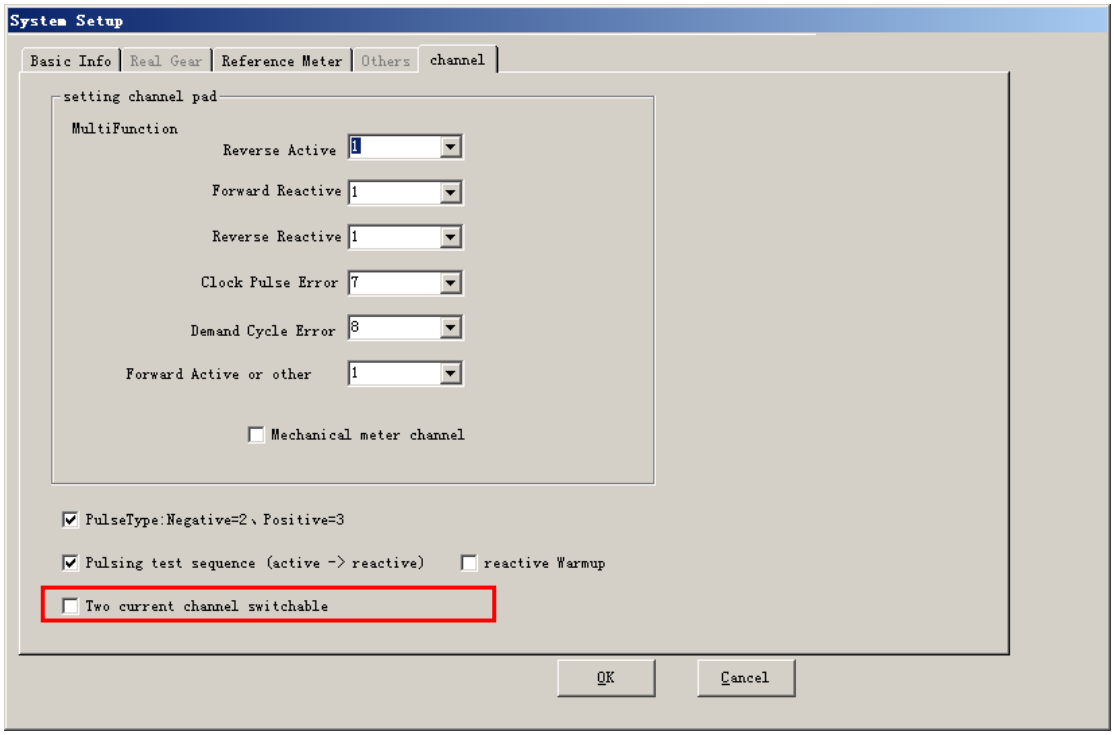


4.4. Pulse sensor type

Direct connect will clips or use optical sensor

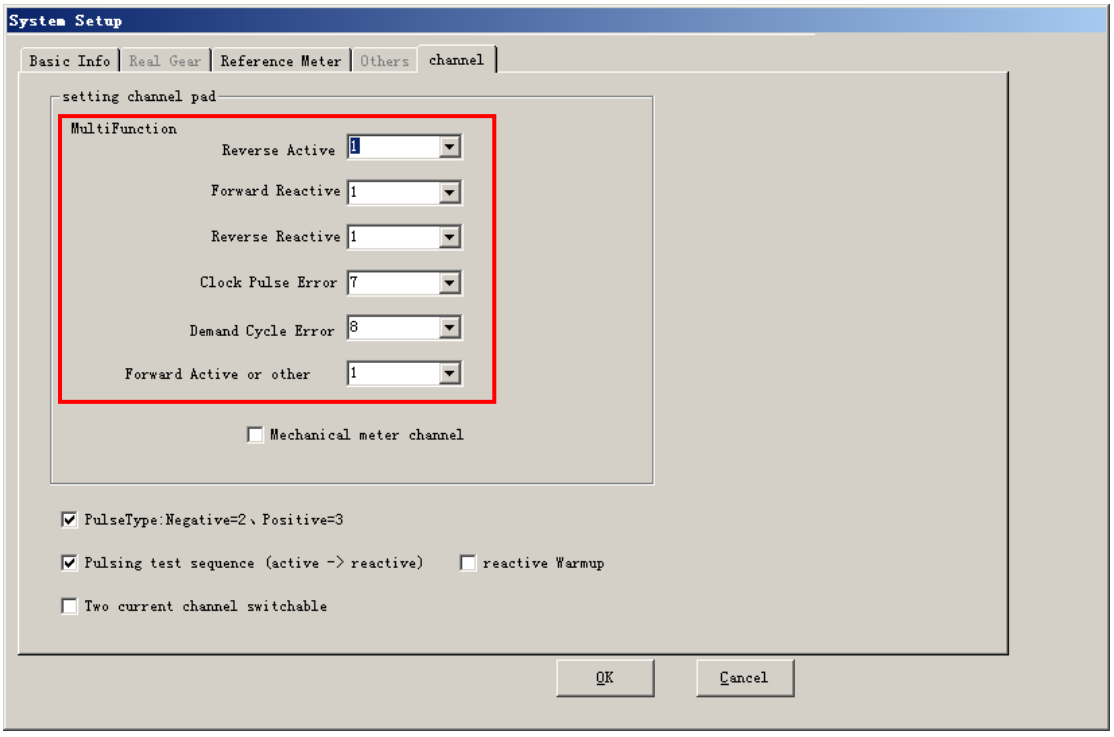


4.5. Dual current selection



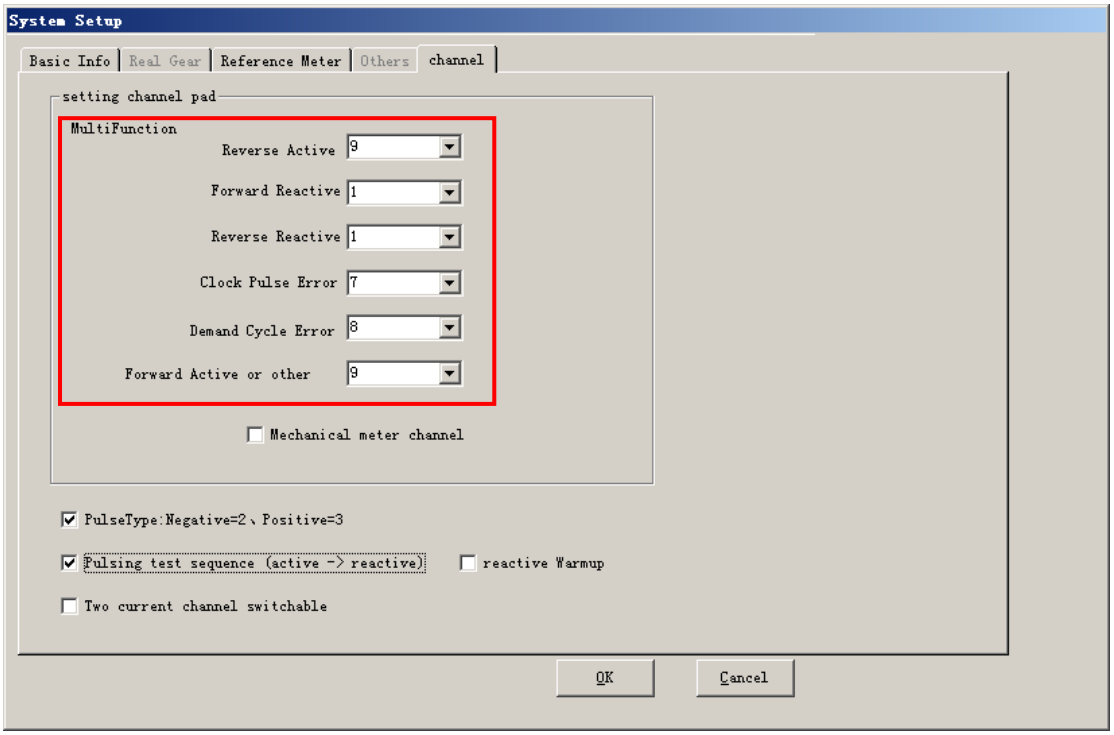
4.6. Pulse channel

4.6.1. Single sensor model

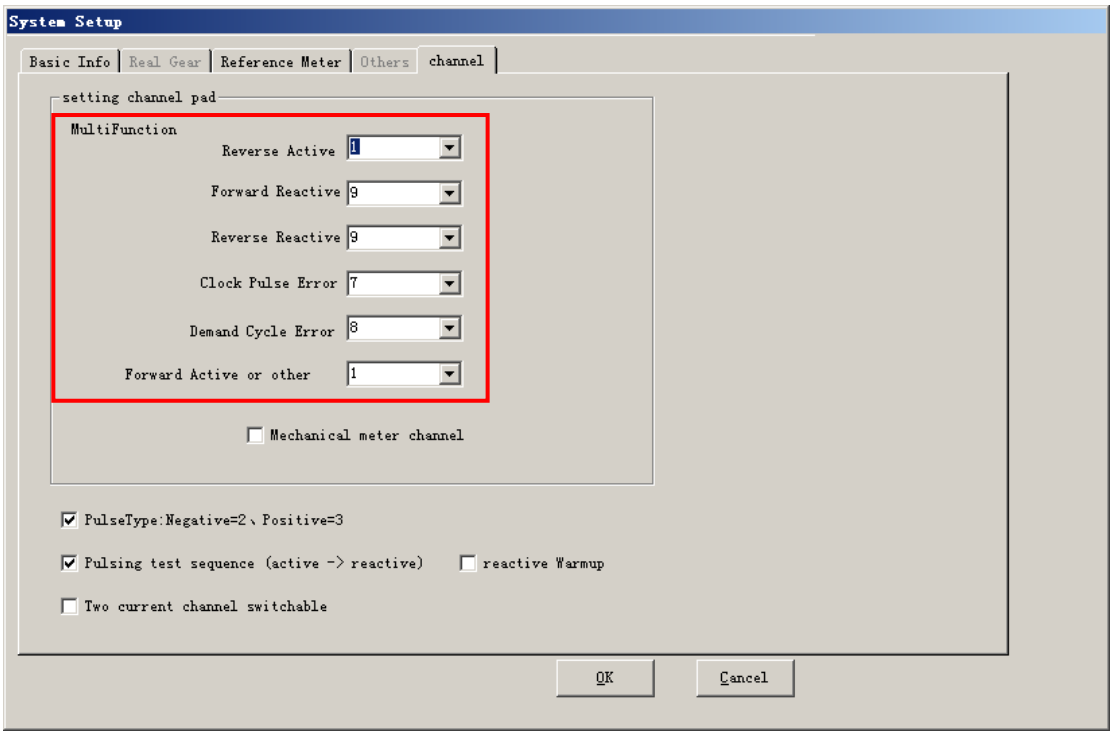


4.6.2. Dual sensor model

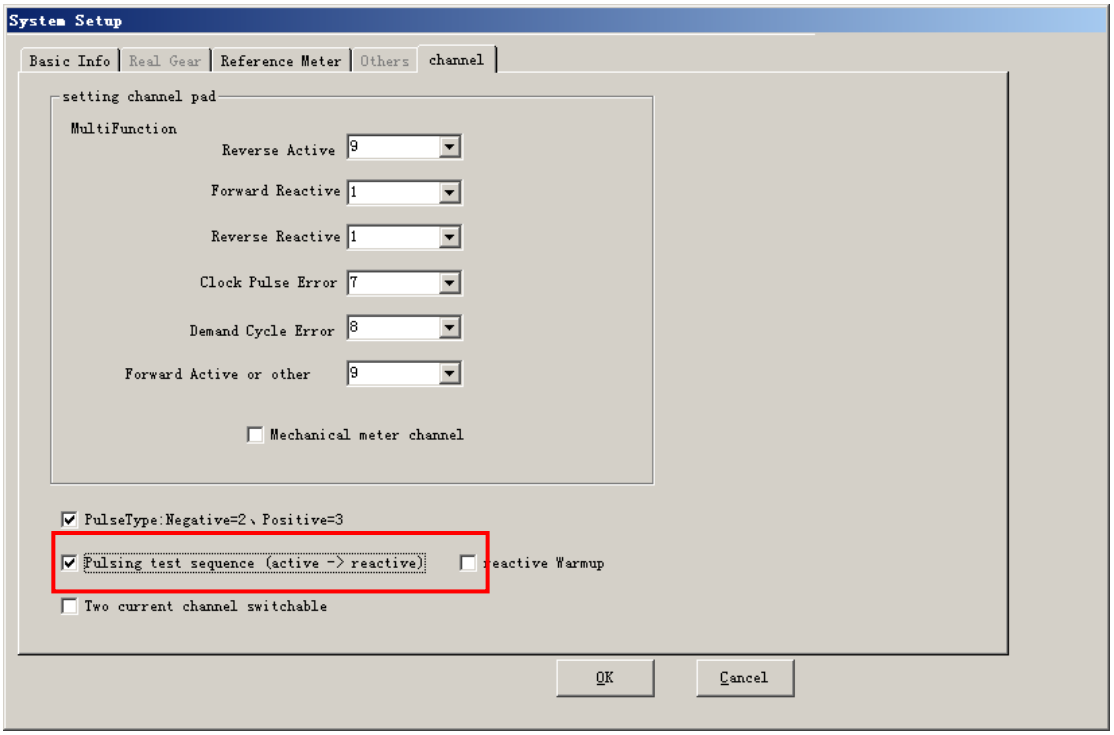
Active pulse on the left side sensor, while reactive pulse on the right side sensor.



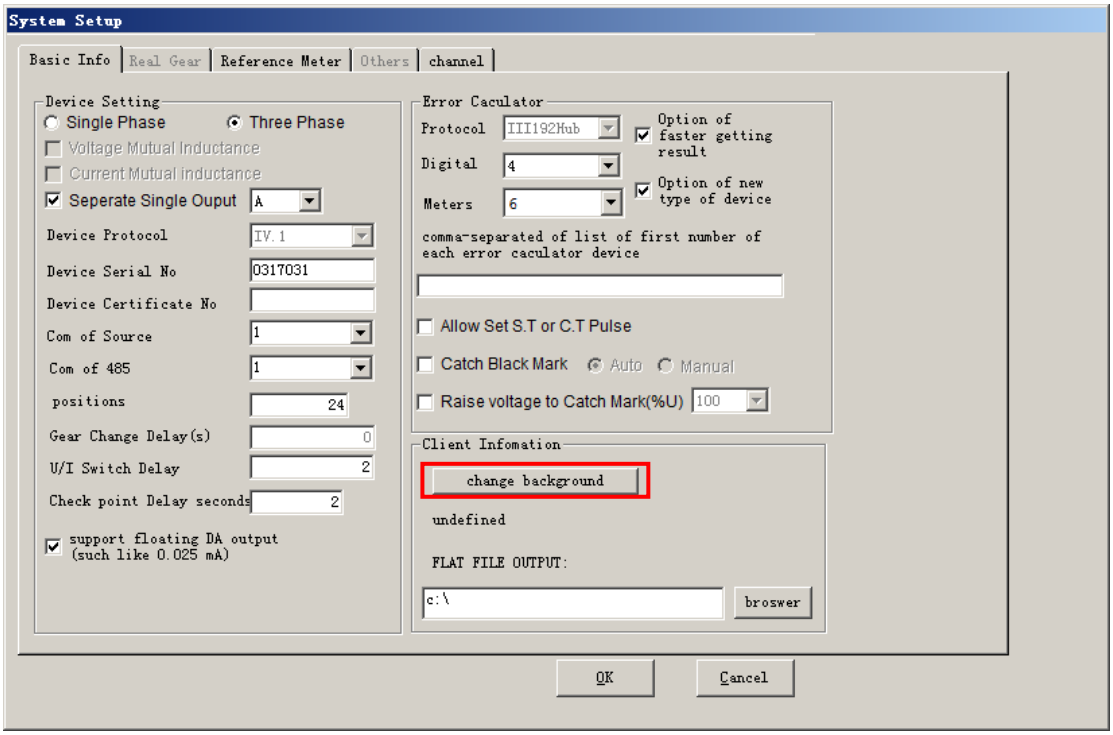
Reactive pulse on the left side sensor, while active pulse on the right side sensor.



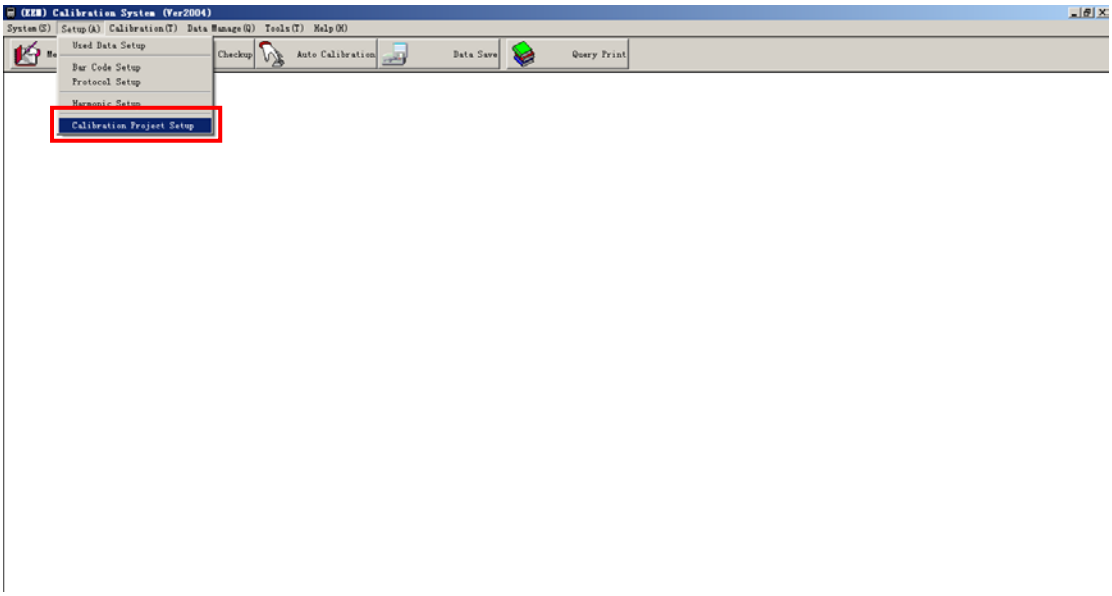
Active pulse test finish, will inform user to change sensor to reactive pulse.



4.7. Change background photo

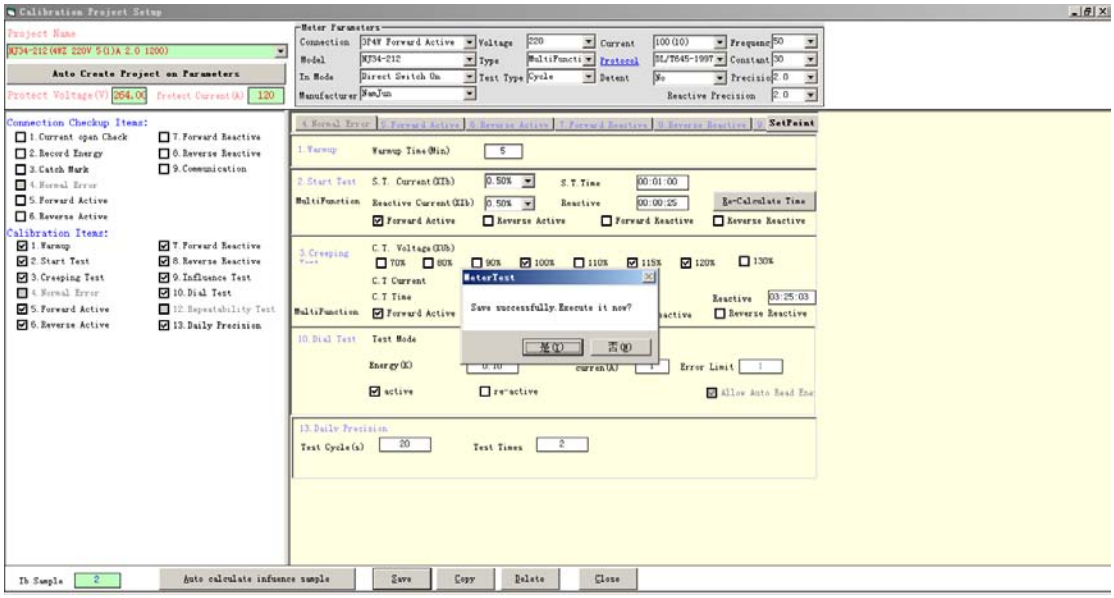


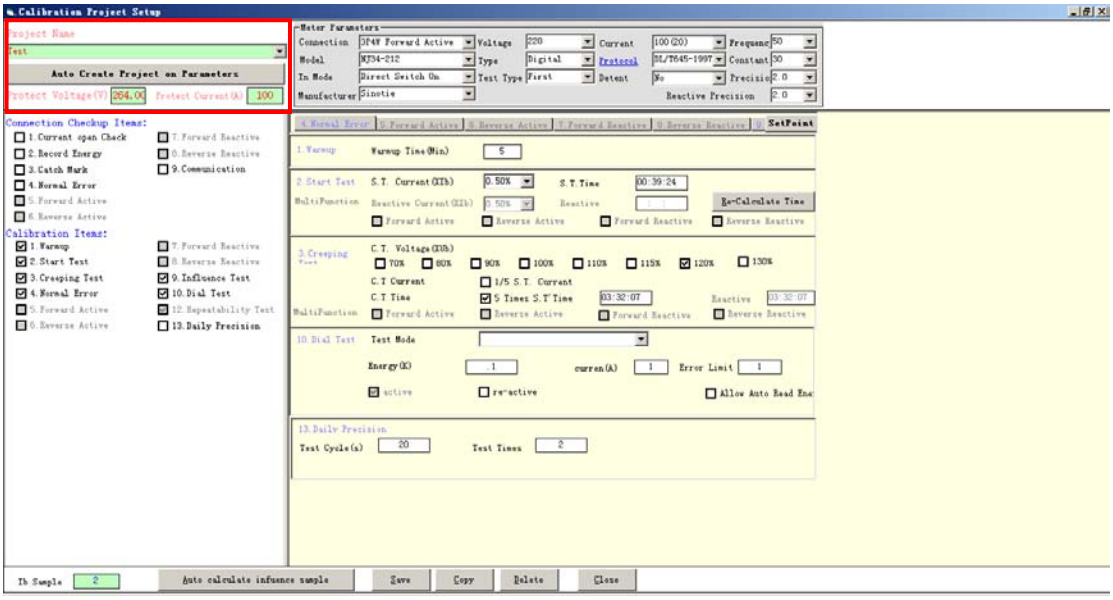
5. Calibration project setup



5.1. Calibration setup main page

Input project name, protection voltage, protection current and click ‘save’ button.





5.2. Meter parameter input

Connection mode: 3p4w Forward active, 3p4w Forward reactive

3p3w Forward active, 3p3w Forward reactive

Single phase active, Single phase reverse active

Model: As per meter model

In Mode: Direct switch on

Manufacturer: As per meter manufacture

Voltage: Meter phase voltage, maximum 480V

Type: Mechanical, MechEle, Digital, Multi-function

Test type: First test / circle test (circle test means the meter failed the test at the first time and need to redo a second test)

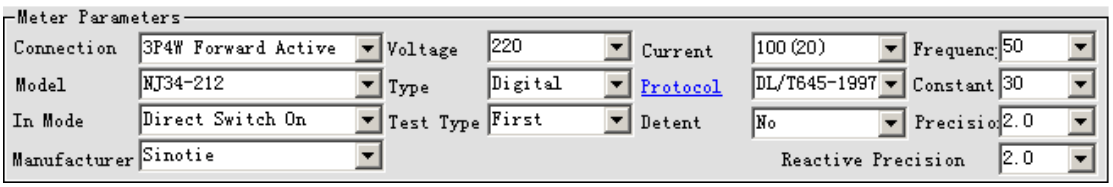
Current: Imax(Ib), maximum 120A

Frequency: 45Hz~65Hz

Constant: pulse/Kwh

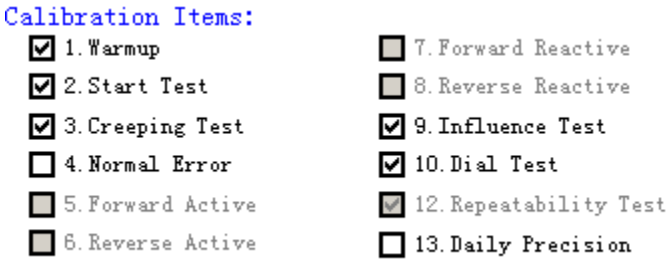
Precision: As per meter precision

Reactive precision: As per meter precision

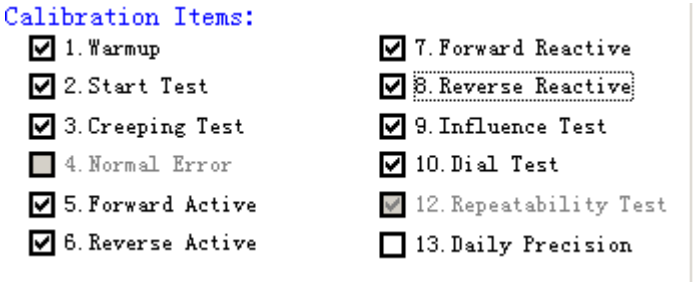


5.3. Calibration Items

For Mechanical, MechEle, Digital meter type, the calibration item as follow,



For Multi-function meter type, the calibration item as follow,



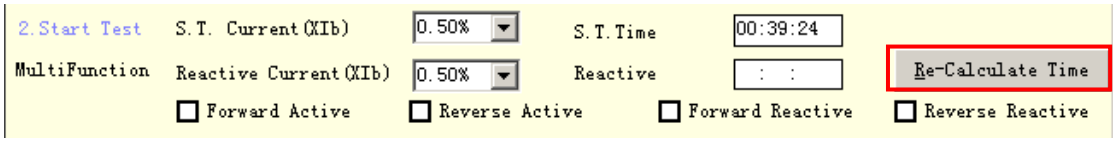
5.3.1. Test 1. Warm up

Warm up with rated voltage and Ib current.

Input the warm up time,

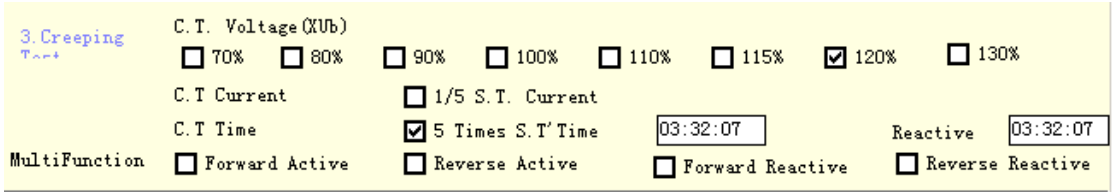
5.3.2. Test 2. Starting Test

Select the starting test current and click 'Re-Calculate Time' for auto calculation of test time. Or can manually input test time.



5.3.3. Test 3. Creeping Test

Select the creeping test voltage, creeping test current, creeping test time. Or can manually input test time.



5.3.4. Test 4. Normal Error test

This test is only available for Mechanical, Digital, MechEle meter type

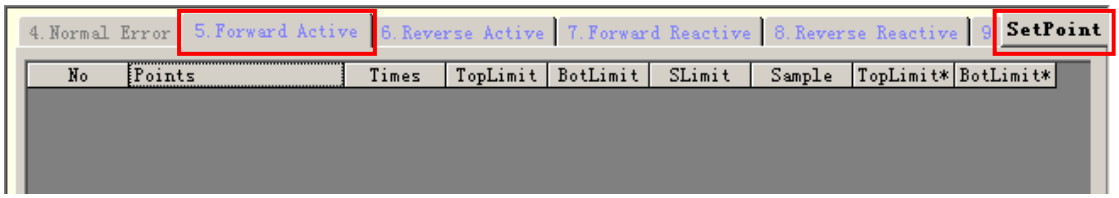
Directly Click 'SetPoint' to go to test point setting page

5.3.5. Test 5~8. Forward /Reverse Active, Forward /Reverse Reactive test

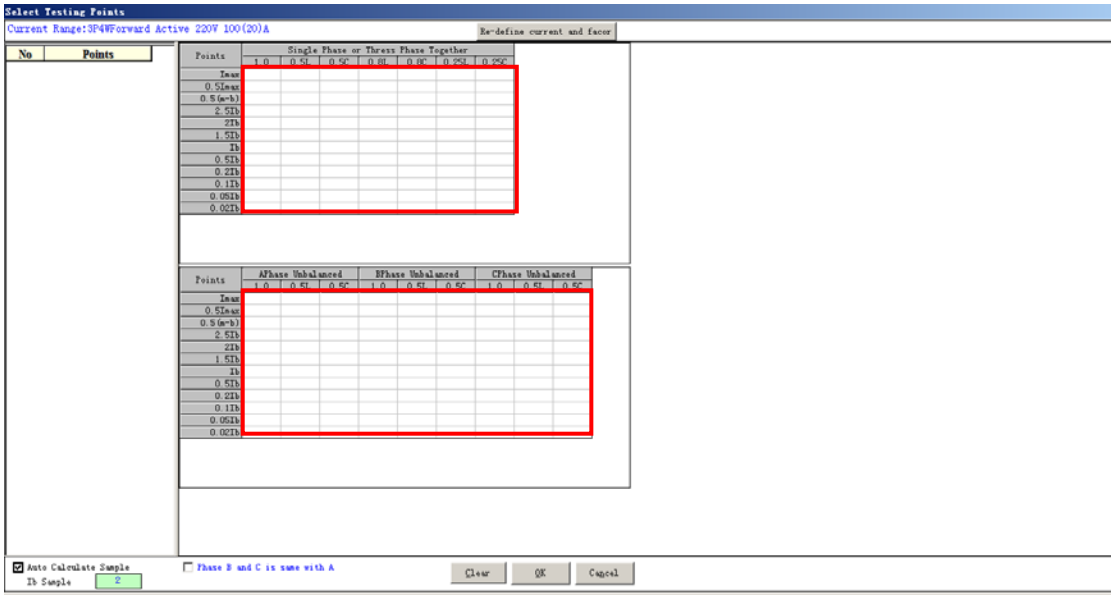
This test is only available for Multifunction meter type

For example: Forward active test point setting, need to click '5.Forward Active' and then

click ‘SetPoint’ to go to test point setting page



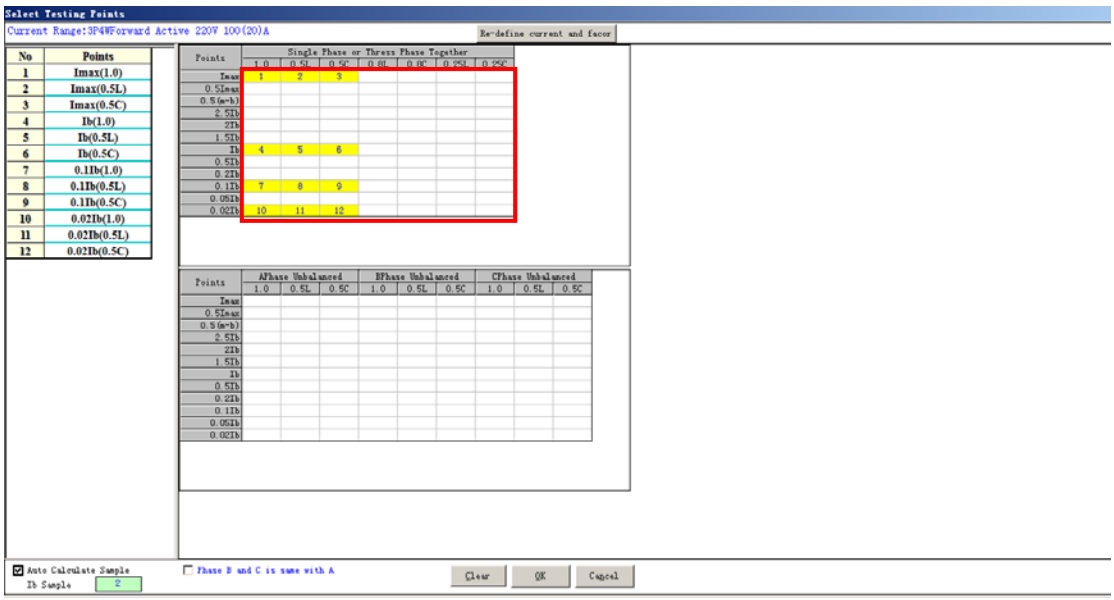
5.3.6. Test point selection and charactorize



5.3.6.1. Test point selection for unity phase(three phase)

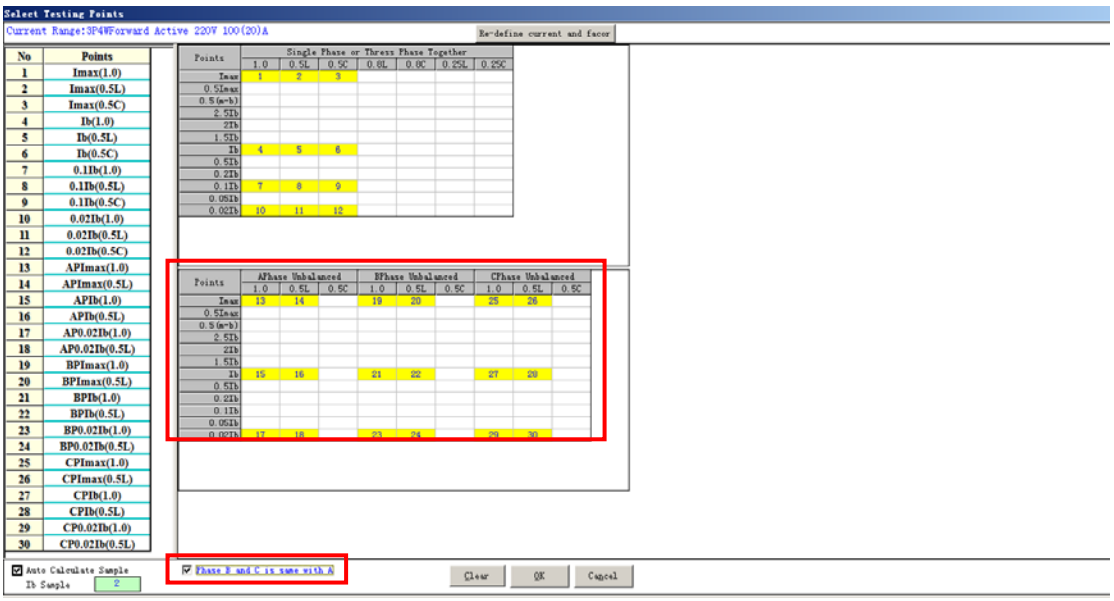
Select the test point by clicking the unit, after selection the test points is highlight in yellow. The number of the highlight yellow unit indicating the test sequence.

Poly phase test point,



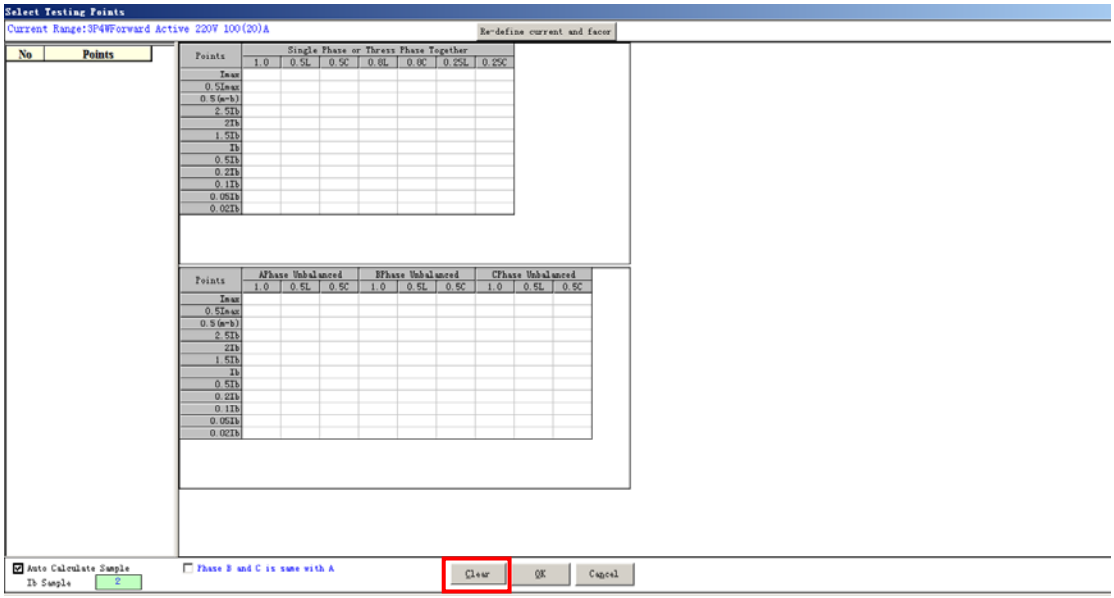
5.3.6.2. Test point selection for unbalance phase

Unbalance test point, by selecting the ‘Phase B and C is same with A’, unbalance test point at phase A,B and C can be set simultaneously.



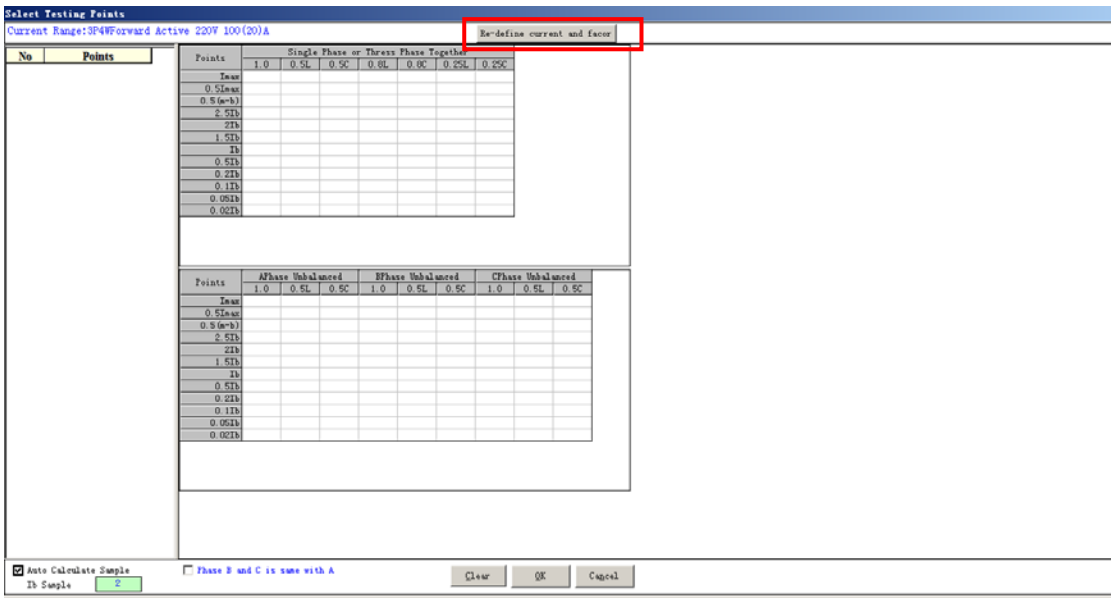
5.3.6.3. Test point clear(delete)

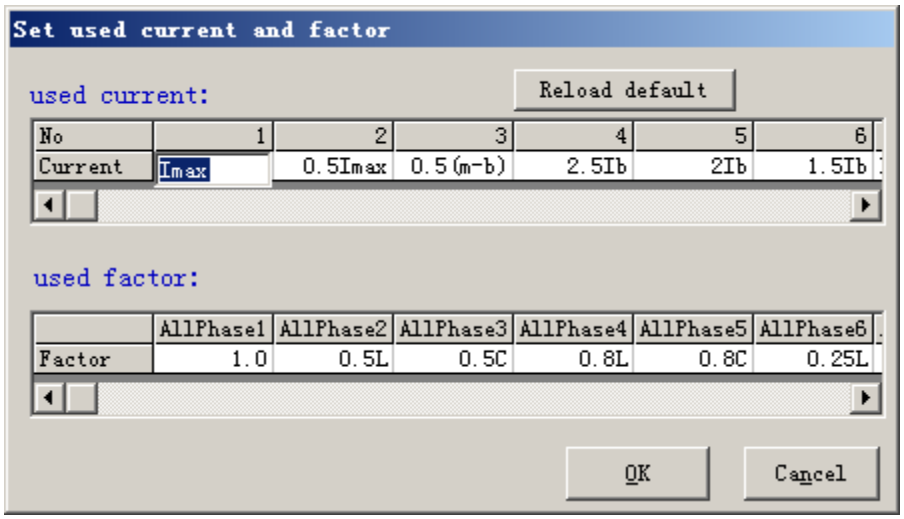
Delete by double clicking the target test point. Or click ‘Clear’ button to delete all test point.



5.3.6.4. Test point Re-define

The test point selection can be customize by clicking the ‘Re-define current and factor’ button.

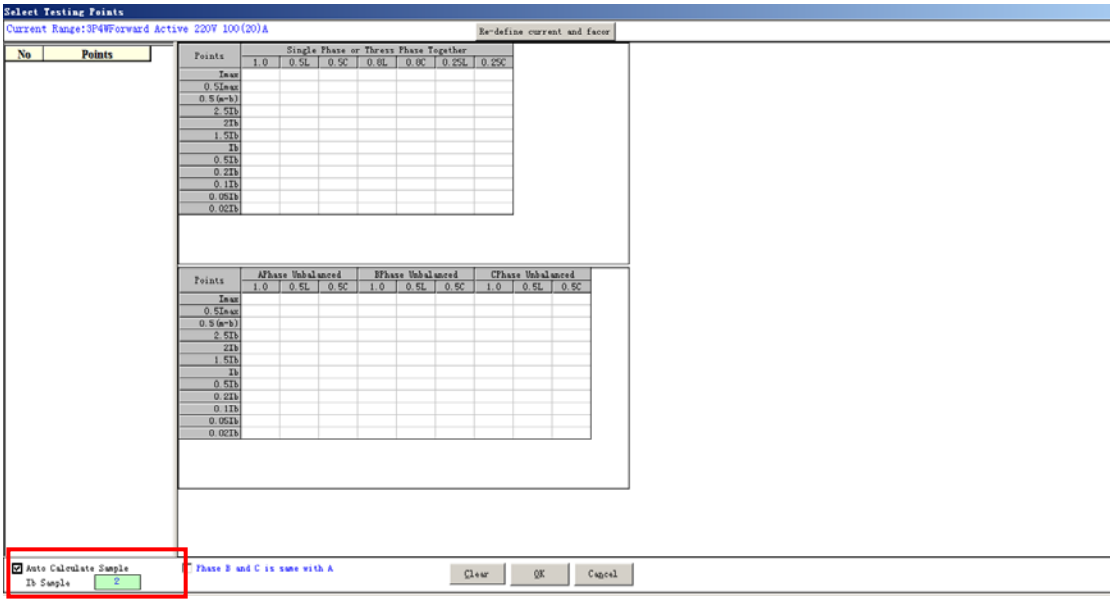




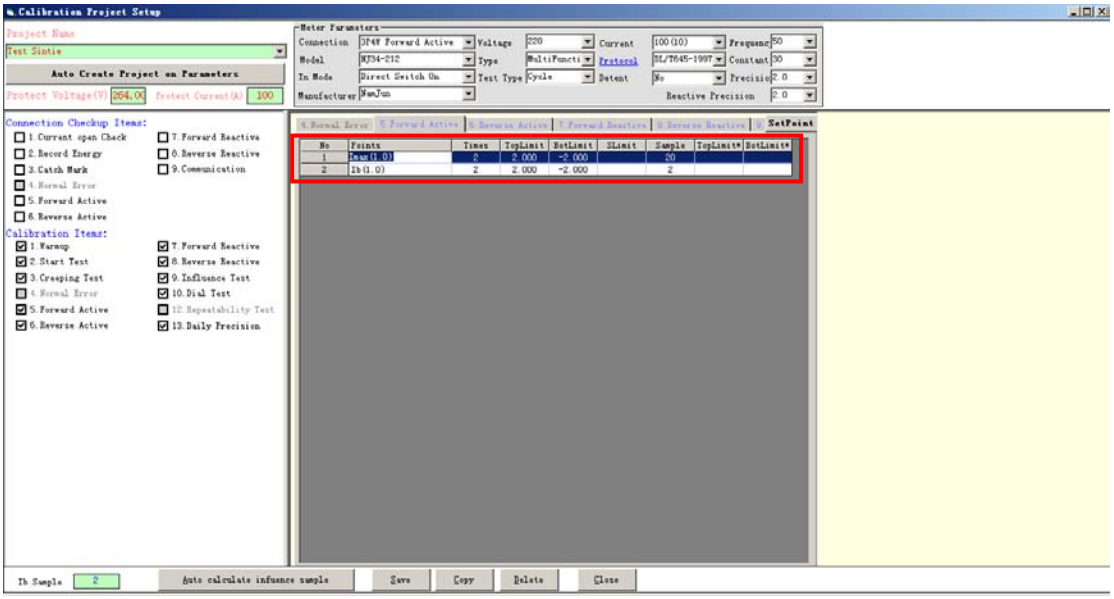
5.3.6.5. Auto calculate sample (pulse number)

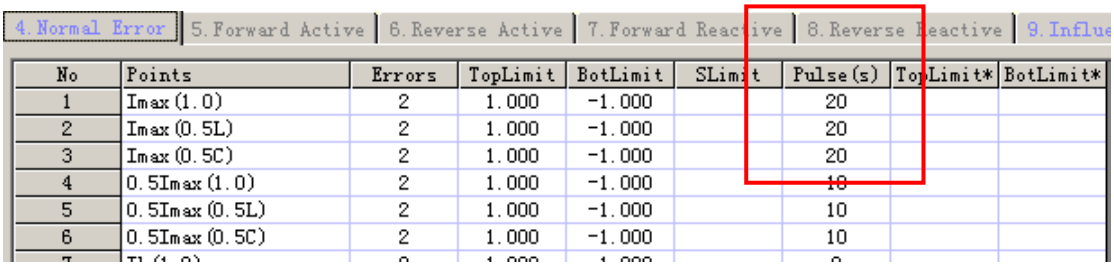
This indicates the sampling pulses at Ib current load point. Numbers of Imax or other current load point sampling pulses will automatically calculate by the Ib/Imax ratio.

For example, with a tested meter Imax/Ib of 10(100)A, the Ib to Imax ratio is 10x. When at Ib sampling pulse set to 2, then at the 0.5 Imax load point sampling pulse will be 10, and Imax load point sampling pulse will be 20.



This will show on the next steps after clicking 'ok'.

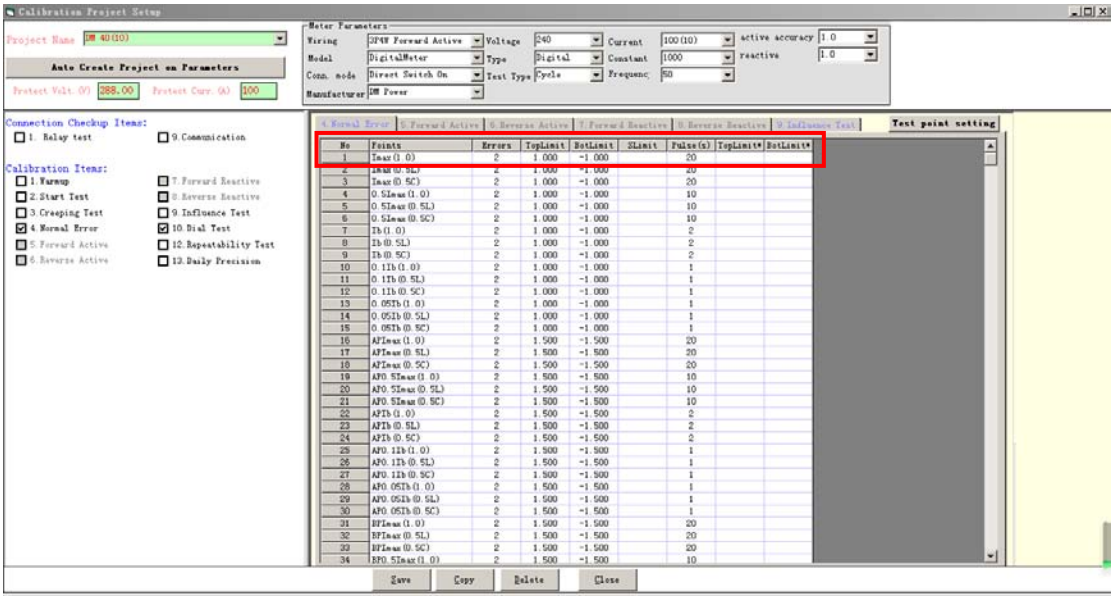




4. Normal Error | 5. Forward Active | 6. Reverse Active | 7. Forward Reactive | 8. Reverse Reactive | 9. Influe

No	Points	Errors	TopLimit	BotLimit	SLimit	Pulse(s)	TopLimit*	BotLimit*
1	Imax(1.0)	2	1.000	-1.000		20		
2	Imax(0.5L)	2	1.000	-1.000		20		
3	Imax(0.5C)	2	1.000	-1.000		20		
4	0.5Imax(1.0)	2	1.000	-1.000		10		
5	0.5Imax(0.5L)	2	1.000	-1.000		10		
6	0.5Imax(0.5C)	2	1.000	-1.000		10		

5.3.6.6. Test point character



No: Test point sequence

Points: Current load point with fix voltage

Errors: Number of error sample taken at each test point to calculate the average error

TopLimit: Upper limit of meter accuracy class.

BotLimit: Lower limit of meter accuracy class.

Slimit:

Pulses(s): Number of pulse sample to calculate an error.

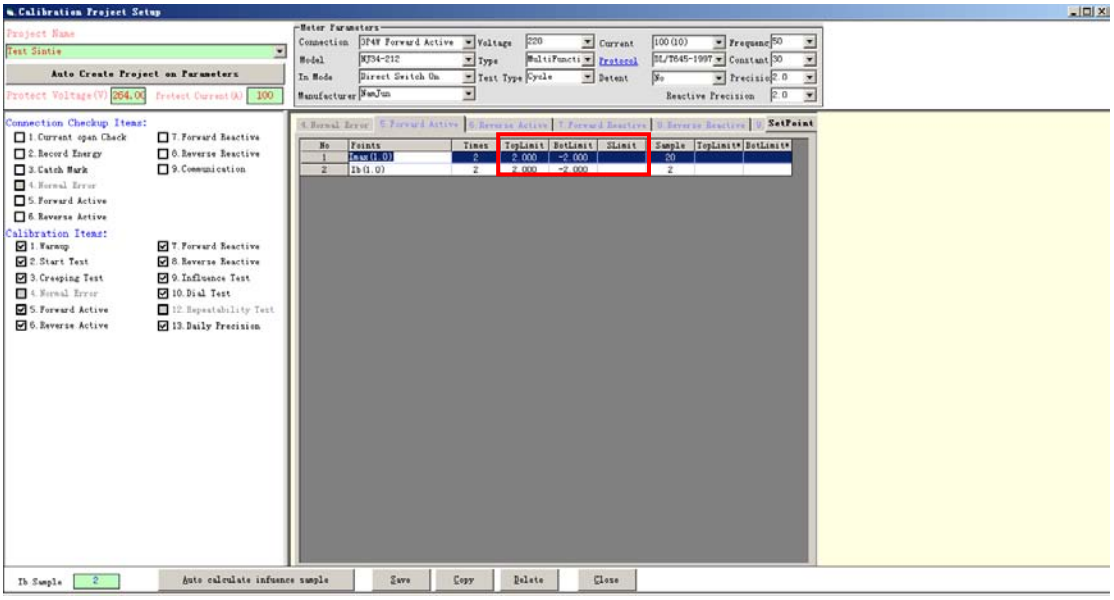
TopLimit(*):

BotLimit(*):

5.3.6.7. TopLimit , BotLimit, SLimit

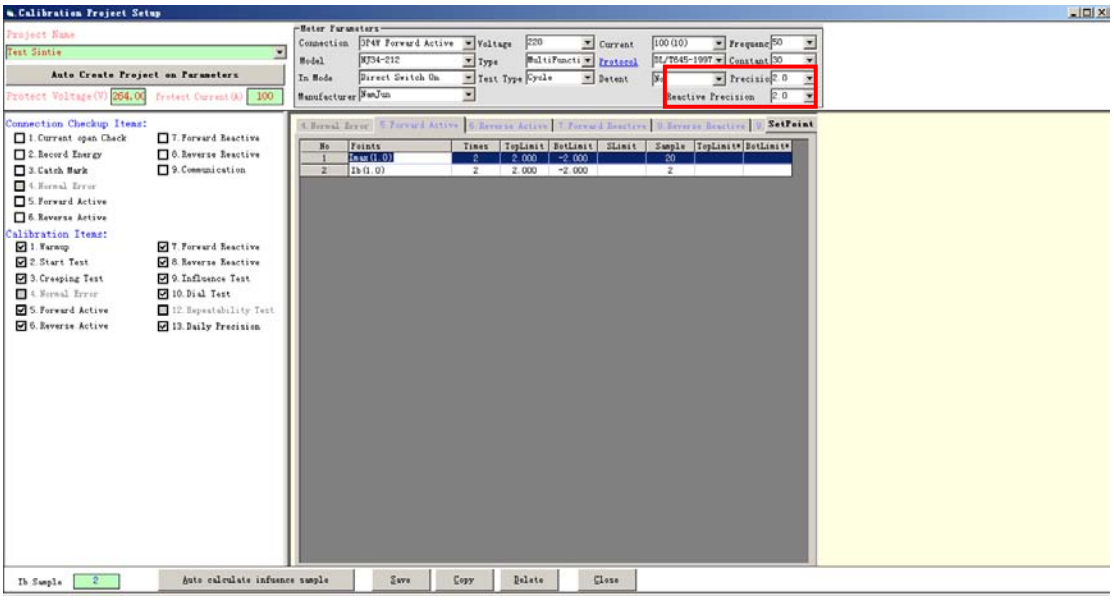
TopLimit reprsent the positive error limit of the meter whereas BotLimit is the negative error limit. SLimit represent the standard deviation limit of each error of the meter.

Usually the top limit and bottom limit is automatically set according to the meter precision when after the test points have been choose. But when testing the test point that is out of the meter normal range, the error limits have to be redefined by the user, for exampling like testing the very small current load.

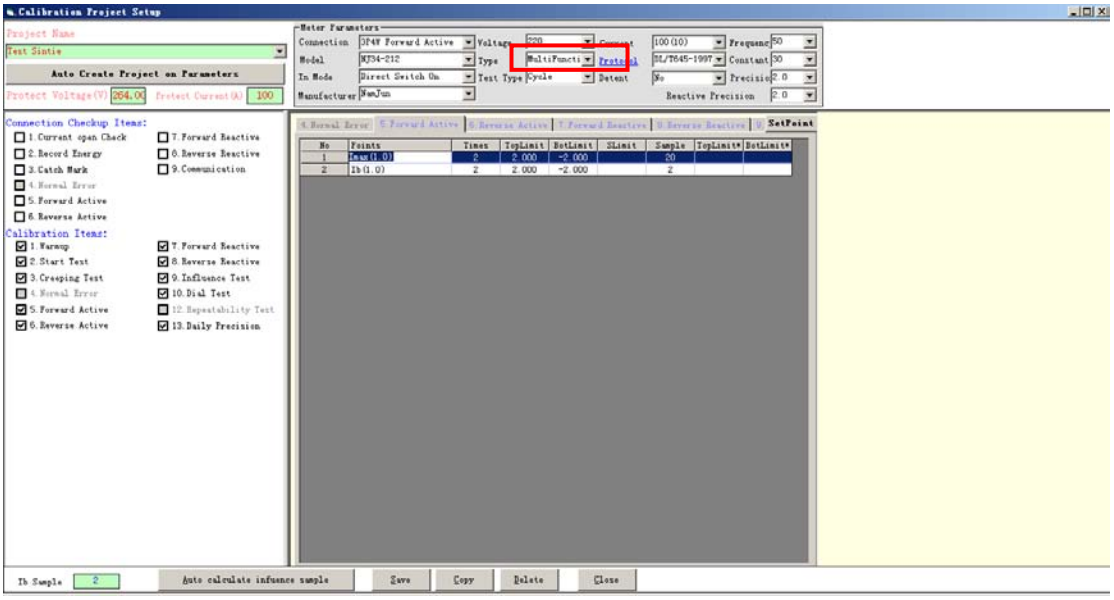


5.3.6.8. Meter that have two limit

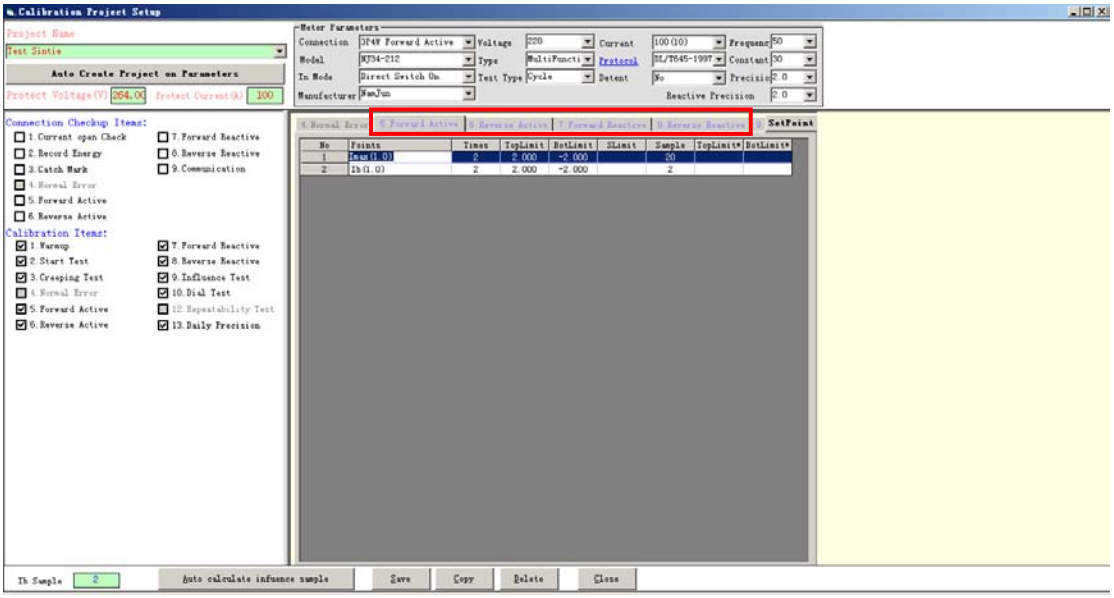
With meters that have two different limit at active and reactive error.



The top limit and bottom limit will automatically input accordingly. This require user to select meter type to Multi-Function.

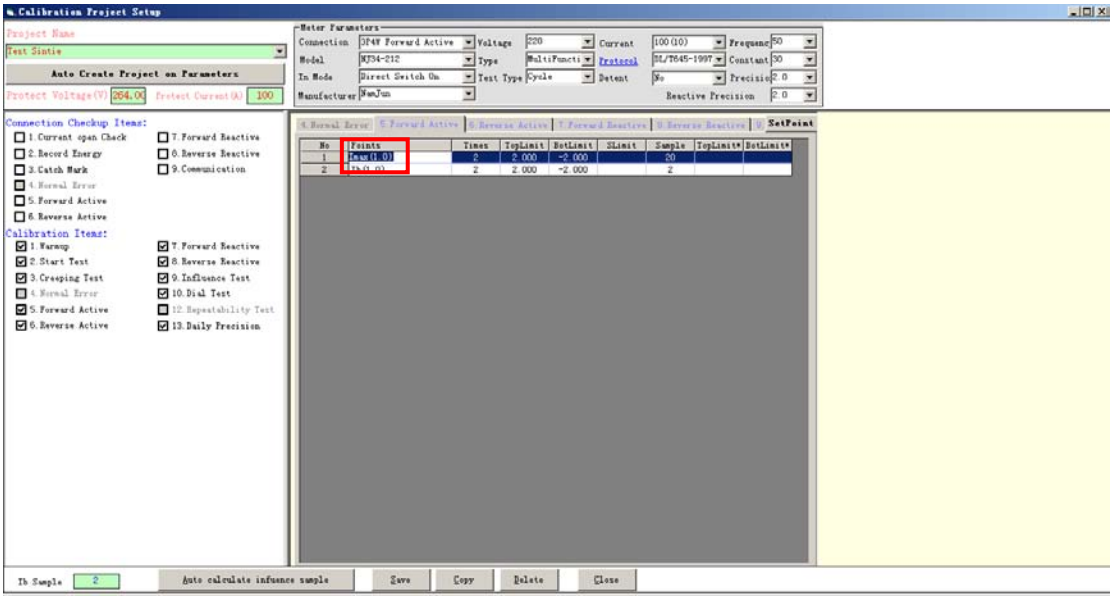


After selecting multifunction, the test points of the active and reactive error have to set independently at chart ‘5.Forward Active’, ‘6. Reverse Active (When the meter require a reverse energy test)’, ‘7Forward Reactive’, ‘8.Reverse Reactive.



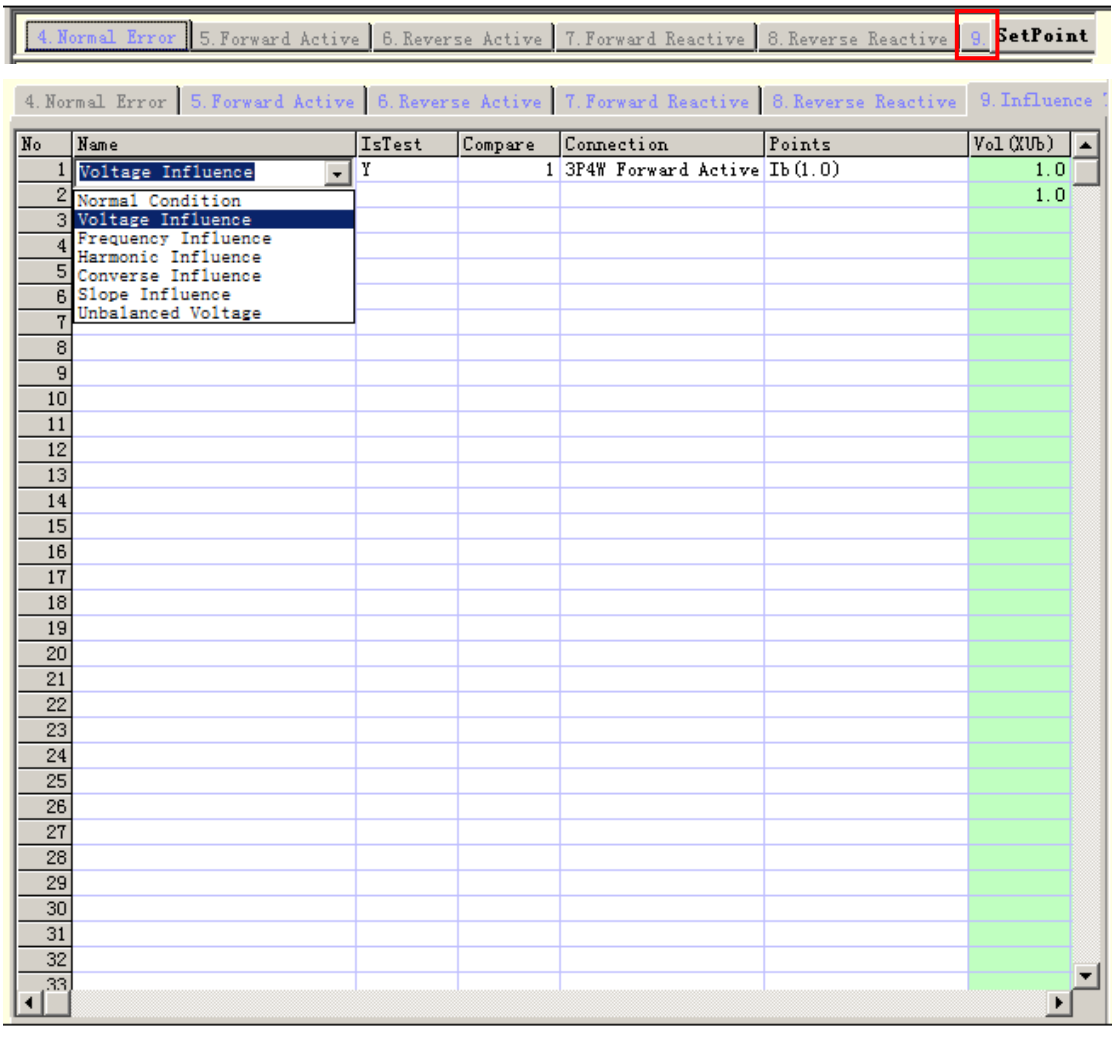
5.3.7. Modify of selected test point

This can be done by directly input test point.



5.3.8. Test 9. Influence test

The influence test setting is hidden in the '9.' button



Voltage influence/ Frequency influence/Harmonic influence setting

No	Name	IsTest	Compare	Connection	Points	Vol(XUb)
1	Voltage Influence	Y	1	3P4W Forward Active	Ib(1.0)	0.9
2	Frequency Influence	Y	1	3P4W Forward Active	Ib(1.0)	1.0
3	Harmonic Influence	Y	1	3P4W Forward Active	Ib(1.0)	1.0

No	Vol(XUb)	Fre(Hz)	Harmonic	LeanAngle	IsConvers	VolSel	CurSel	ErrLimit	ChgLimit
1	0.9	50	No	0	N	ABC	ABC	2.000	3.00
2	1.0	51	No	0	N	ABC	ABC	2.000	3.00
3	1.0	50	5Times(10%Un 40%Io)	0	N	ABC	ABC	2.000	3.00

No	Harmonic	LeanAngle	IsConvers	VolSel	CurSel	ErrLimit	ChgLimit	Sample	Times
1	No	0	N	ABC	ABC	2.000	3.000	2	
2	No	0	N	ABC	ABC	2.000	3.000	2	
3	5Times(10%Un 40%	0	N	ABC	ABC	2.000	3.000	2	

Name: Influence factor

Is Test: Y/test, N/not test

Compare:

Connection: Meter wiring

Points: Current load point, test current

Vol(Xub): Test voltage

Fre(Hz): Test frequency

Harmonic: Injected harmonic

Lean Angle:

Is Convers:

VolSel:

CurSel:

ErrLimit:

ChgLimit:

Sample: Number of pulse for calculating each error.

Times: Number of error samples to save to report

ACur(XIB):

BCur(XIB):

CCur(XIb):

AAngle:

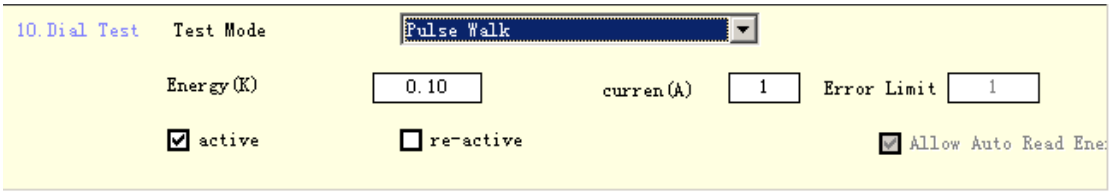
Bangle:

CAngle:

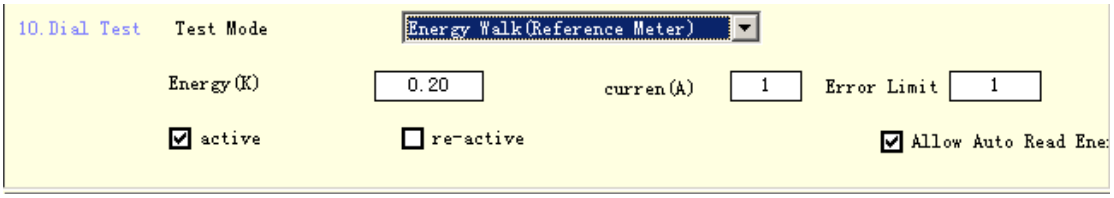
5.3.9. Test 10. Dial test

There are four dial test mode for selection.

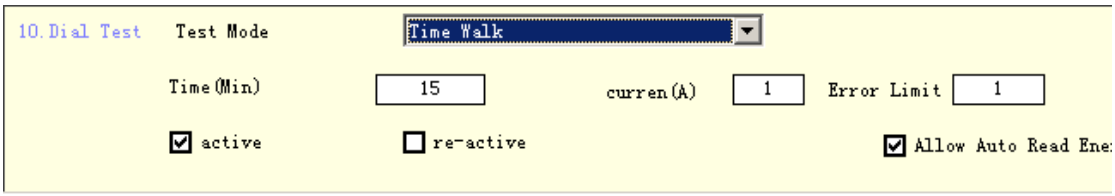
5.3.9.1. Pulse walk



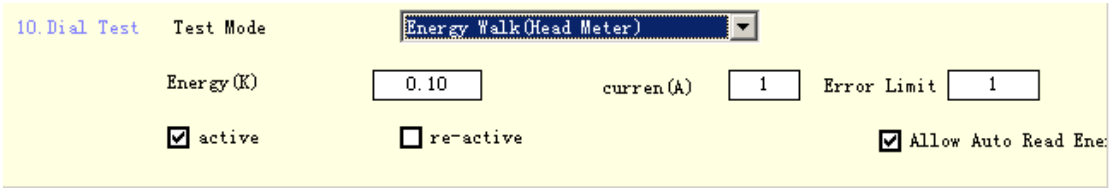
5.3.9.2. Energy walk(reference meter)



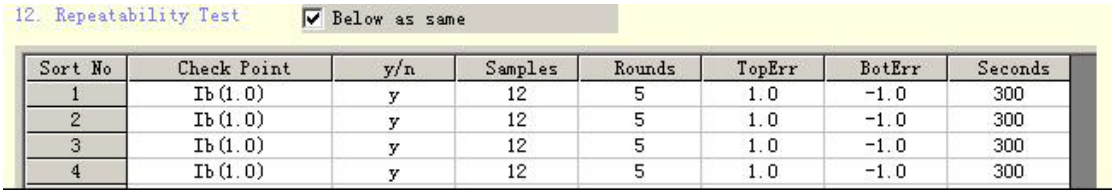
5.3.9.3. Time walk



5.3.9.4. Energy walk(Head meter)



5.4. Test 12. Repeatability test



Sort No	Check Point	y/n	Samples	Rounds	TopErr	BotErr	Seconds
1	Ib(1.0)	y	12	5	1.0	-1.0	300
2	Ib(1.0)	y	12	5	1.0	-1.0	300
3	Ib(1.0)	y	12	5	1.0	-1.0	300
4	Ib(1.0)	y	12	5	1.0	-1.0	300

Check point: test current load point

y/n: select to test or not test, y is test, n is not test

Samples: number of error to take in the test

Rounds: pulse number to take at each error

TopErr: top limit of the test

BotErr: bottom limit of the test

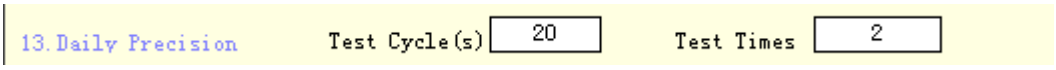
Seconds: waiting time between each sample

For example:

Sort No	Check Point	y/n	Samples	Rounds	TopErr	BotErr	Seconds
1	Ib(1.0)	y	12	5	1.0	-1.0	300

This means at each 300 seconds, will takes an error sample, and this sample will take 5 pulses circle to make. The whole process will repeat 12 times. So the total time will be 300's x12=3600's.

5.5. Test 13. Daily precision

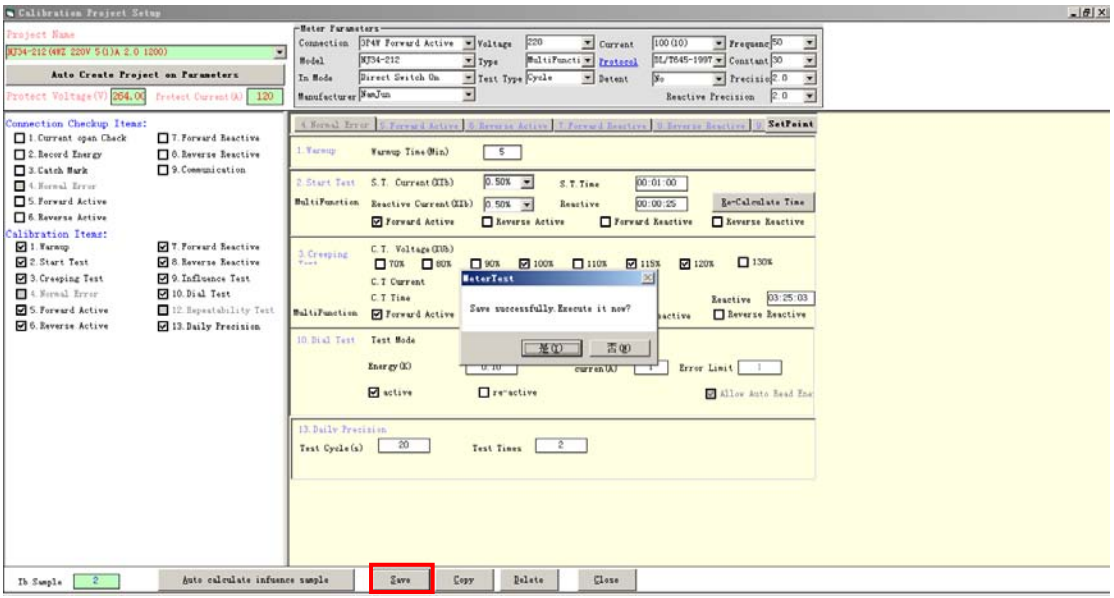


Test Cycles(s): Number of time base pulse to take for calculating one time clock error.

Test Time: Number of error to save to the report.

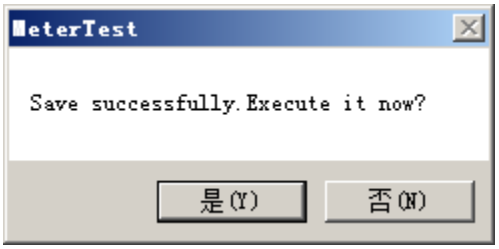
5.6. Save the calibration project setup.

By clicking the ‘Save’ button.



Click ‘Y’ button to continue.

Click ‘Y’ button to continue.



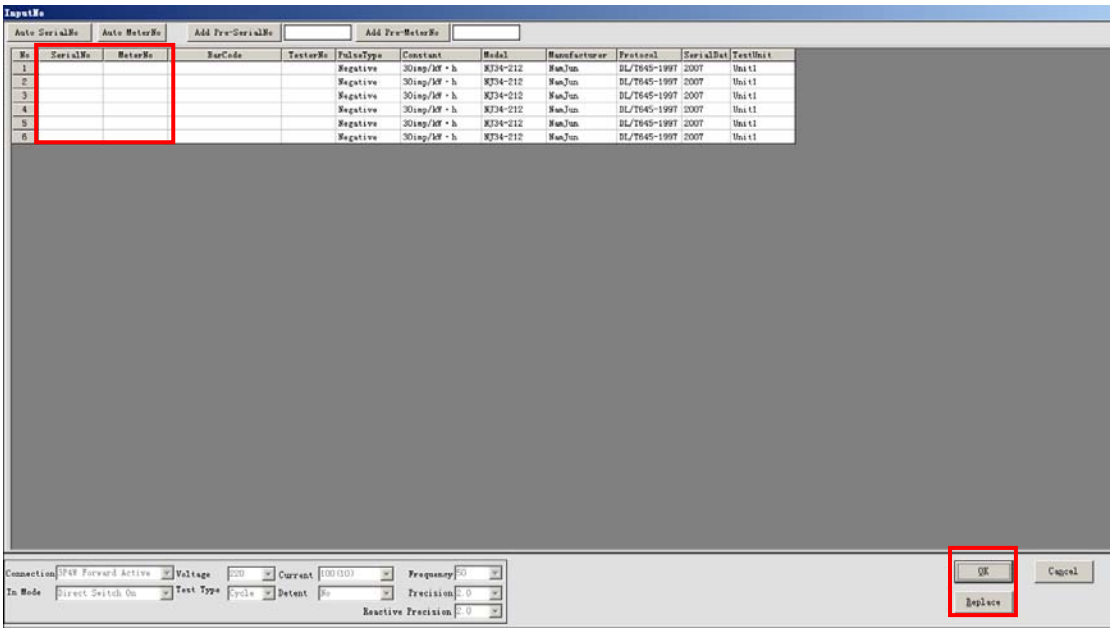
6. Meter data input (for administrator mode)

After saving the project, next will be the meter number input page.

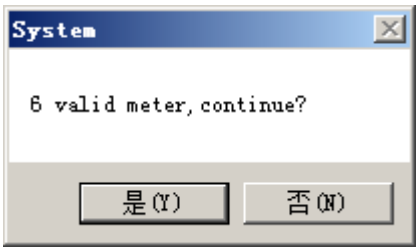
Input meter serial number and meter number by hand or use bar code scanner. Click ‘save’ button.

Bar code scanner, software support all of the cable bound or blue tooth barcode scanner.

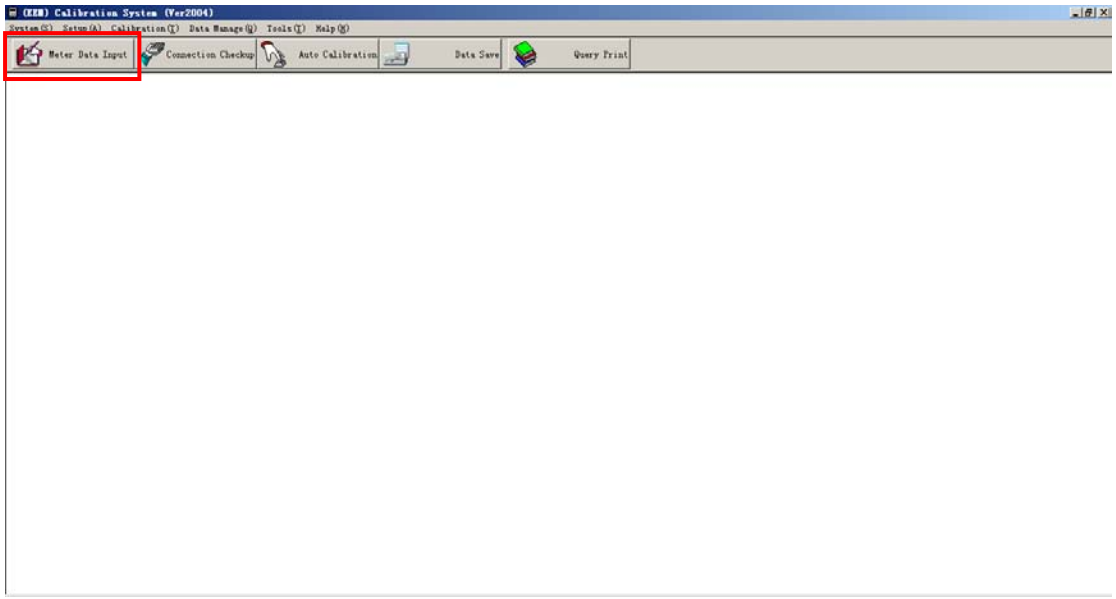
Be attention: When go back to the previous page and changing any setting at the calibration project, need to click ‘Replace’ button to update the information and input serial number and meter number again.



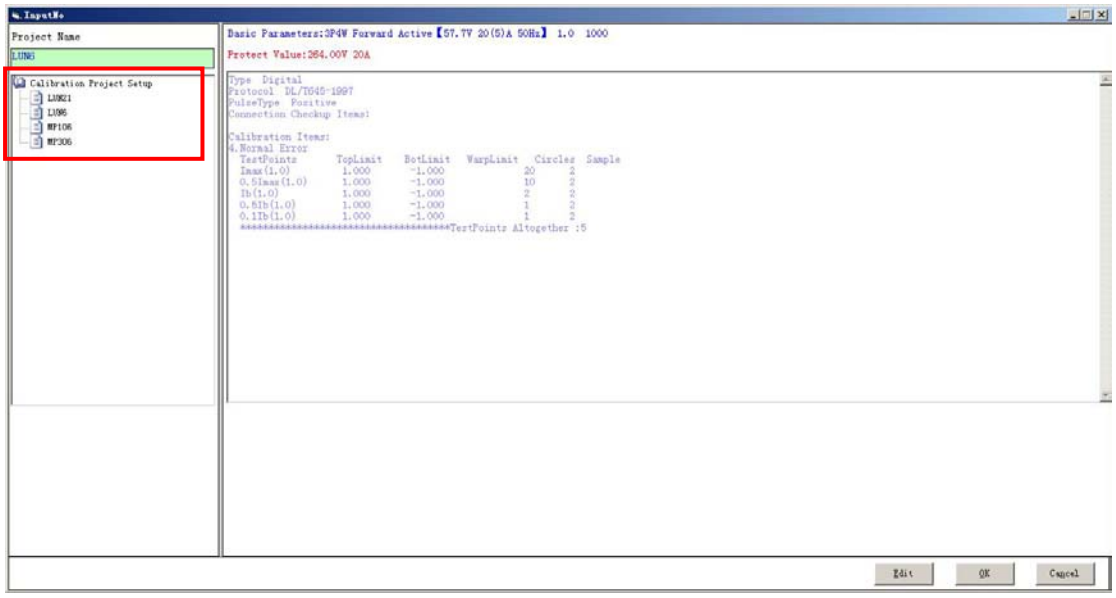
Click 'Y' button to continue.



7. Meter data input (for operator mode)

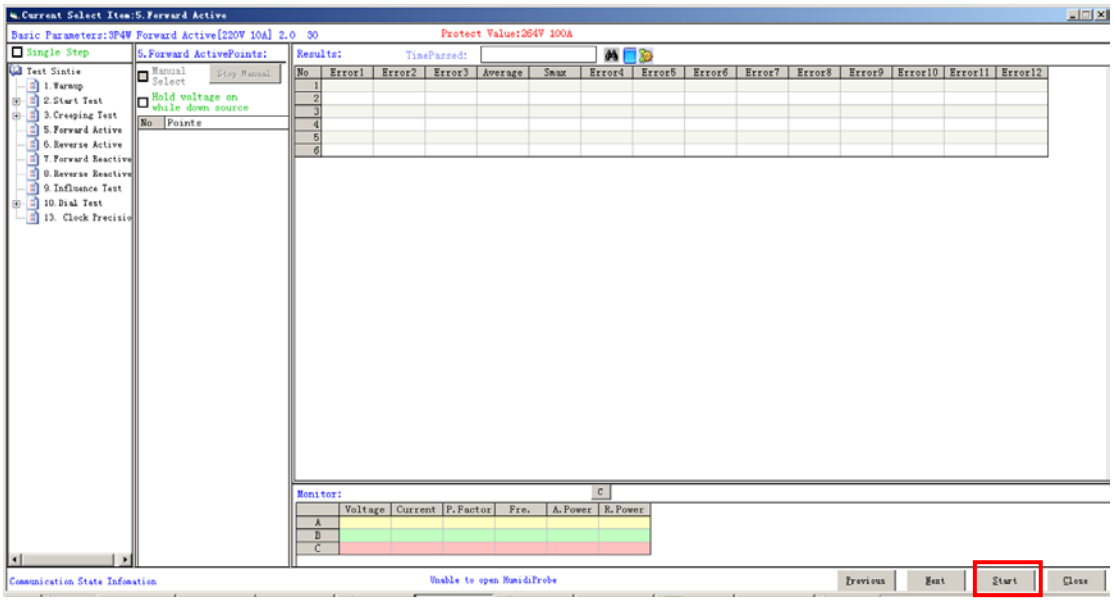


Select meter type:

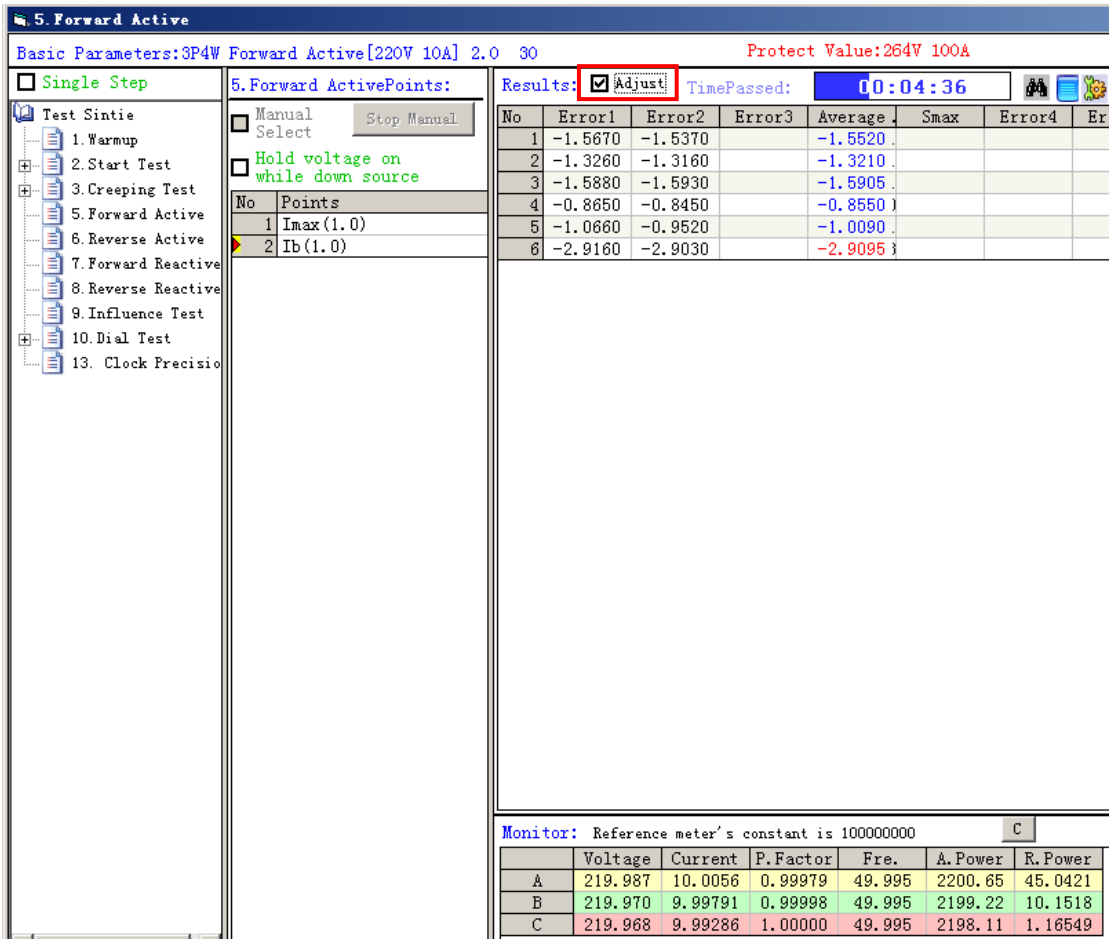


8. Run test

Click ‘Start ’ button to begin the test automatically.

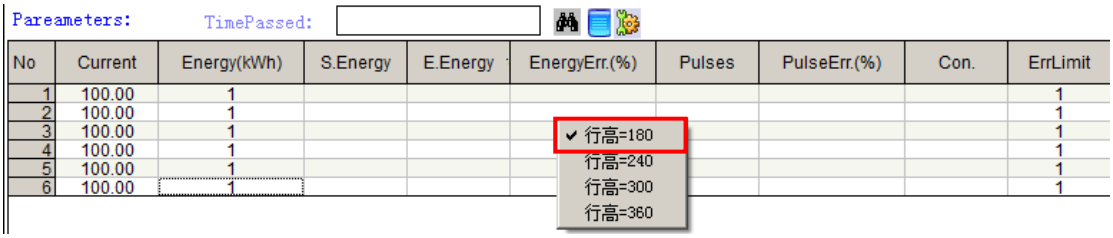


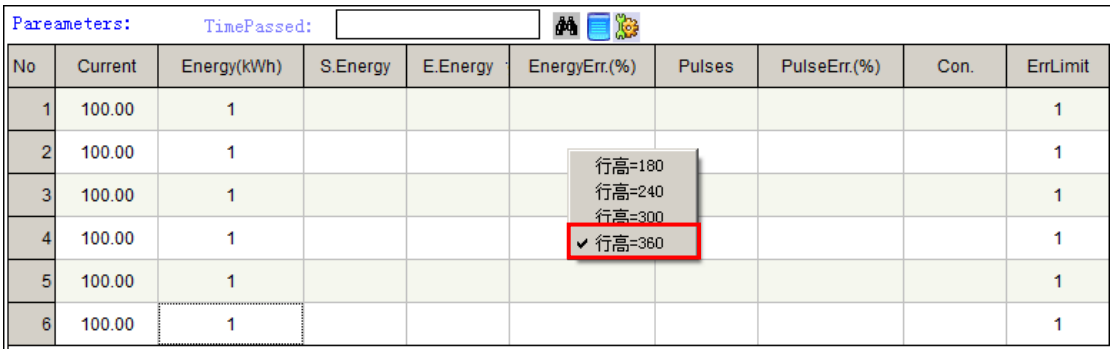
When test is started, click on the ‘Adjust’ function, the present test point will repeat run, this can give enough time for the operator to adjust the pulse sensor. Unselect it to go to the following test point.



8.1. Test field view modify

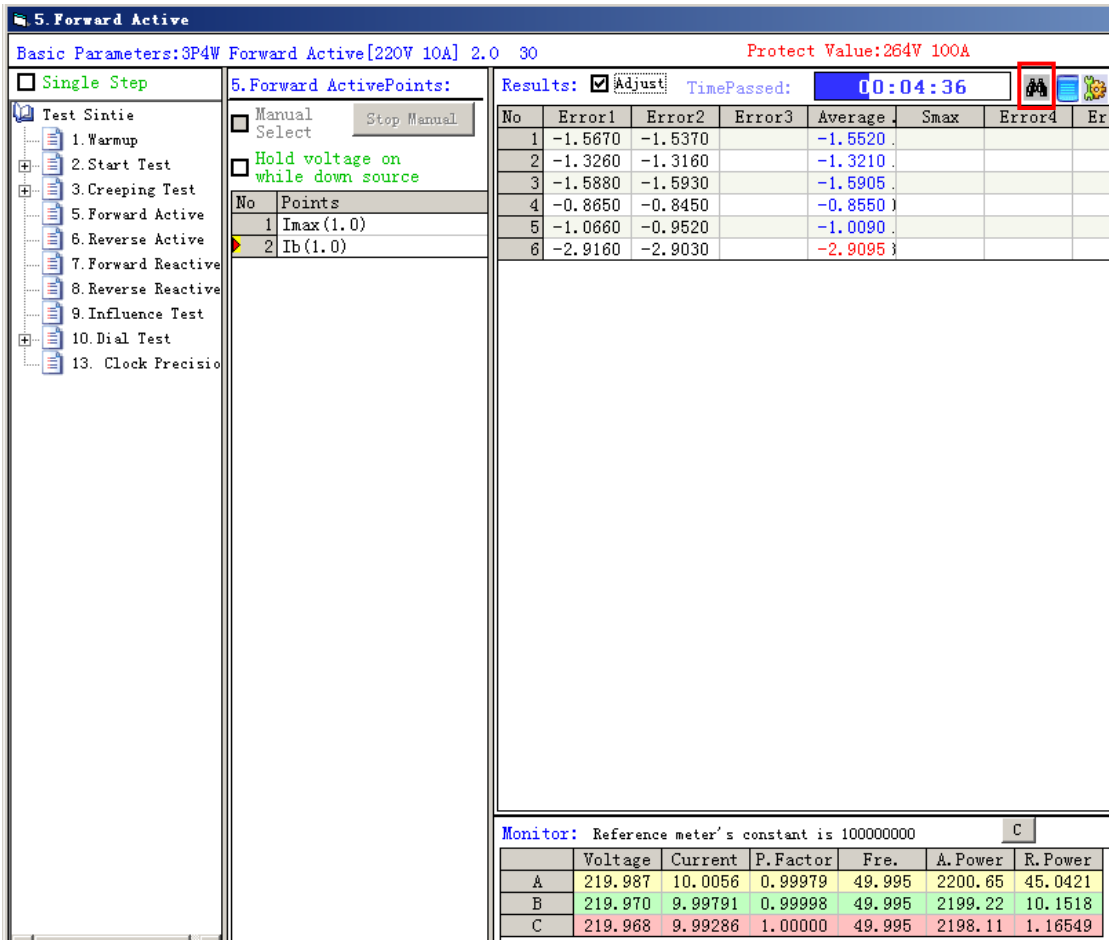
Changing the high of row by right click of the mouse,

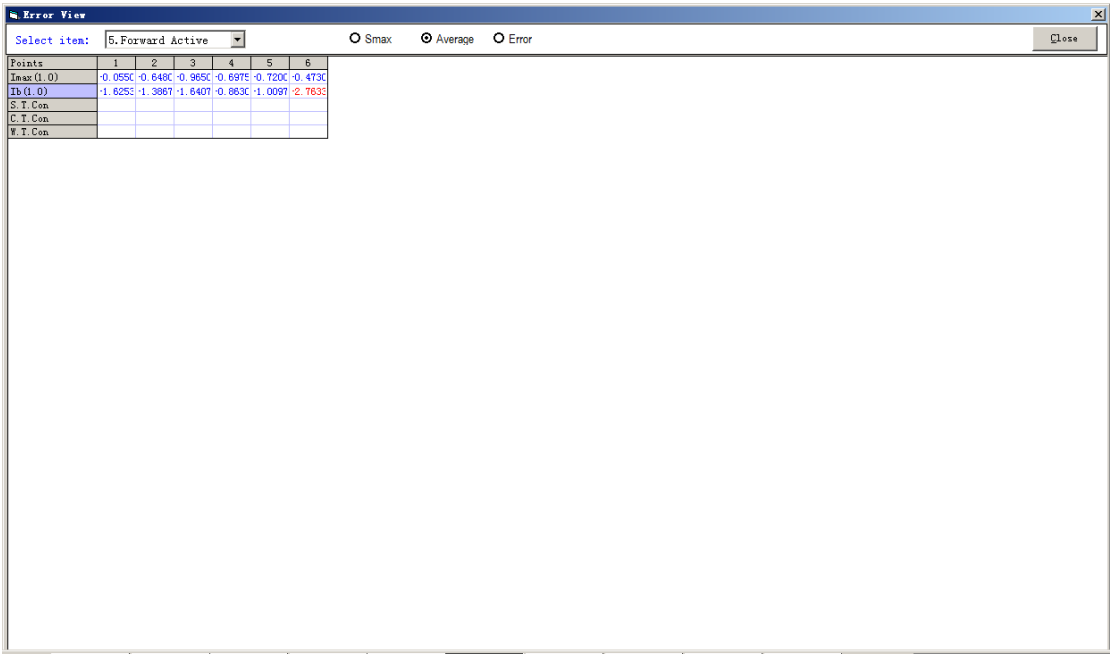


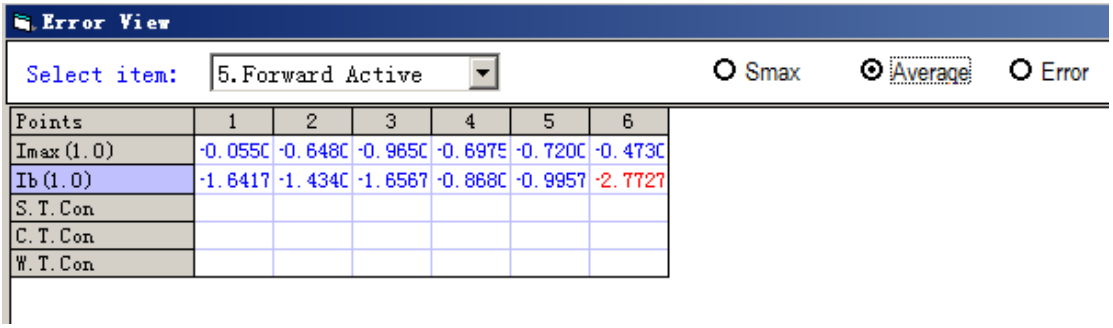


8.2. Test process monitoring

By clicking the small binocular icon, can monitor the test data.

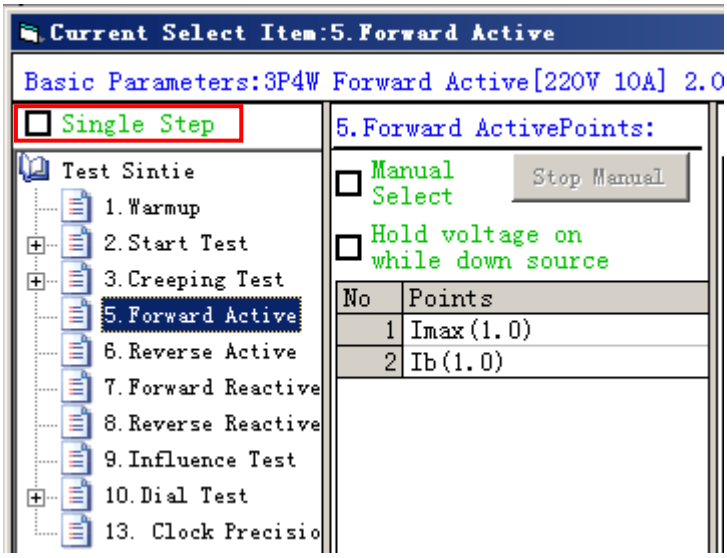






8.3. Single step test

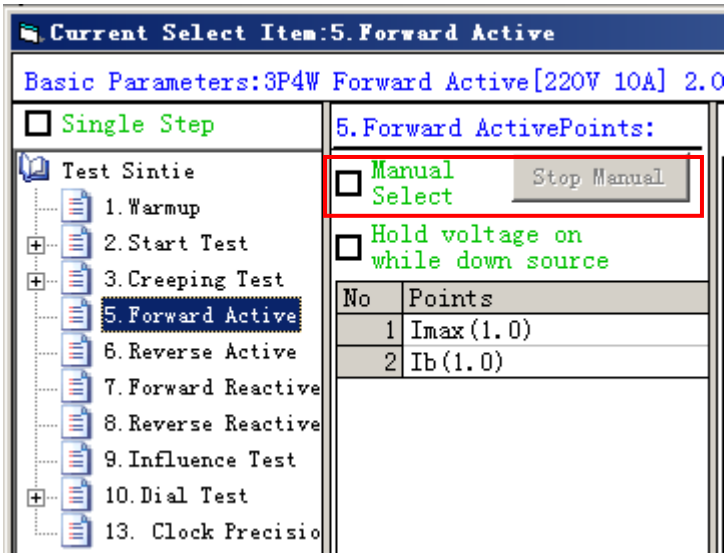
If select the single step, the test will only run on the one selected item.



8.4. Repeat test if the test point is failed.

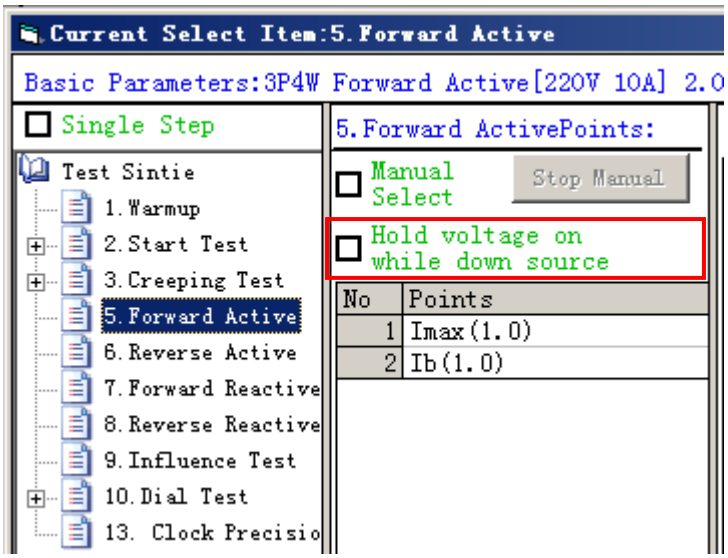
By using the Manual Select function to repeat the test which is previously failed. Here is how to start and to stop manual test.

After error test was completed or stop, selecting 'Manual select' will repeat run once user click on a test point, and can change to any other test point by the user at any time by clicking on the targeted test point. Exit the manual test by click 'Stop Manual'. The previously failed report will be over write and not show in the test report.



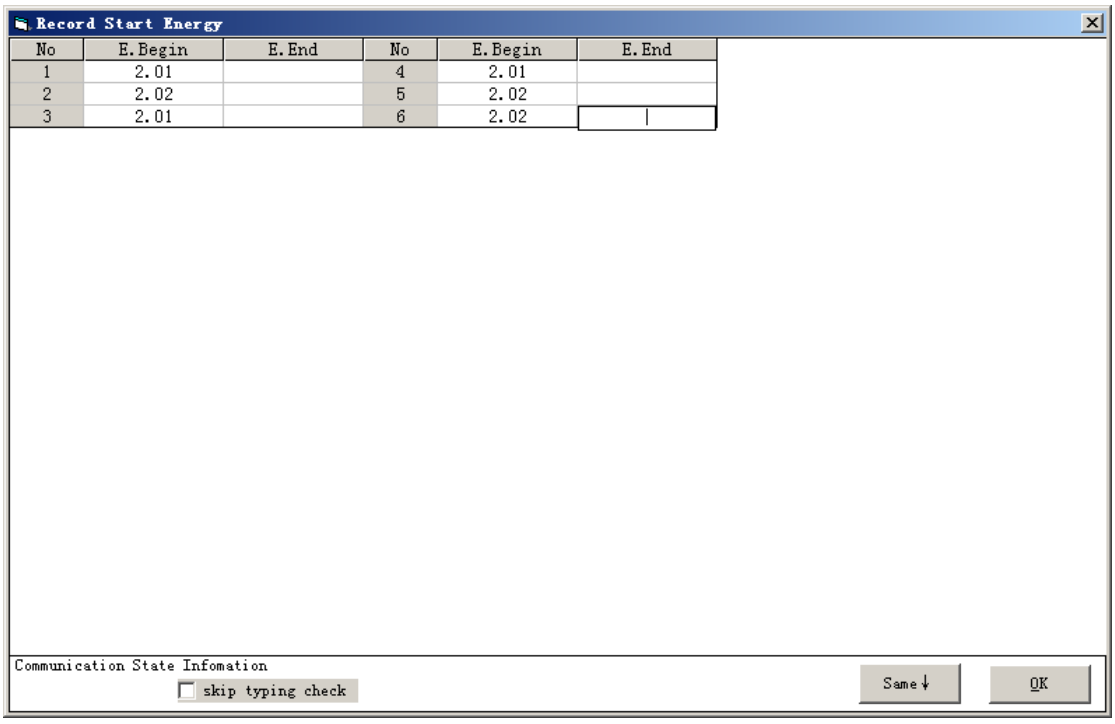
8.5. Hold voltage on while down source

When changing between each test point, the voltage remaining the same.

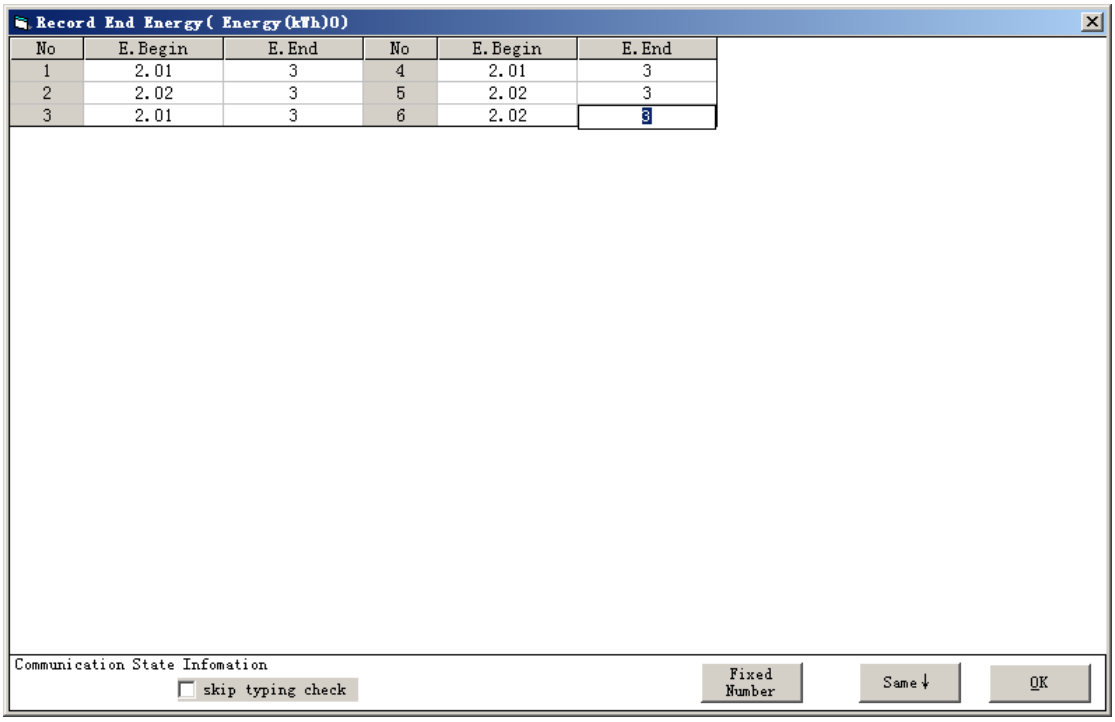


8.6. Dial test(Energy walk- reference meter mode)

Input the meter start energy at the beginning of test.



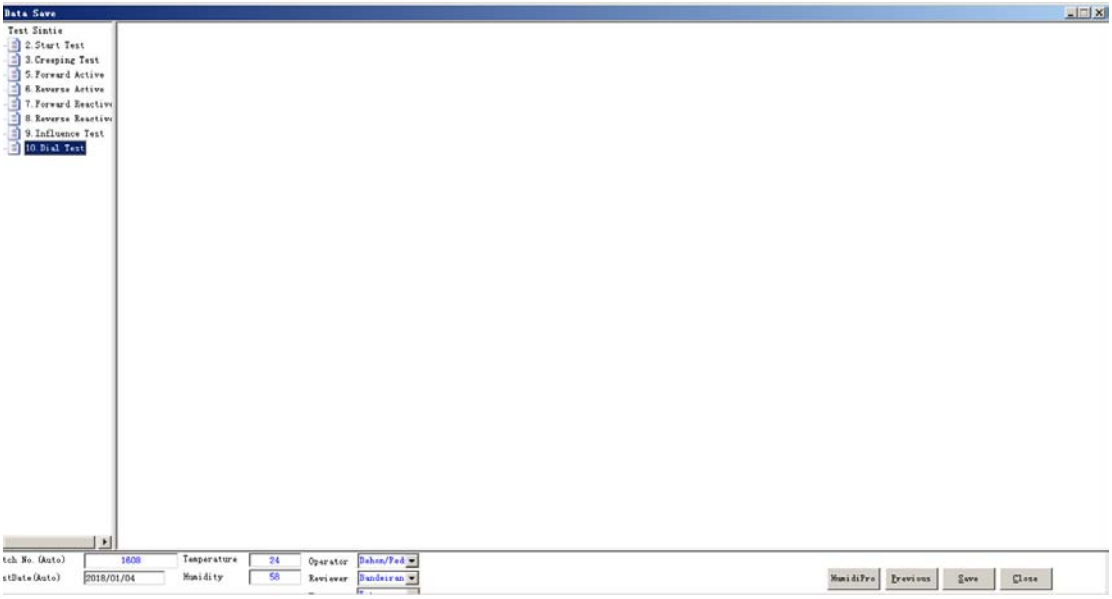
Input the meter start energy at the end of test.



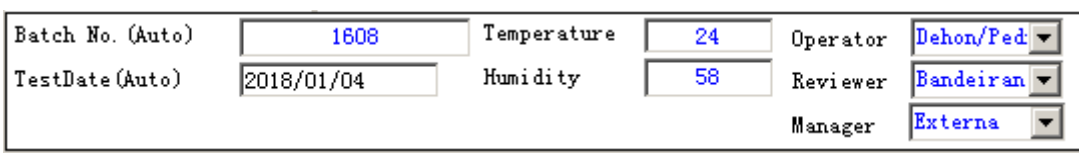
Dial test result

No	Current	Energy(kWh)	S.Energy	E.Energy	EnergyErr.(%)	Pulses	PulseErr.(%)	Con.	ErrLimit
1	100.00	1	1	2.01	1.000	31	3.333	Fail	1
2	100.00	1	1	2.01	1.000	30	0.000	Pass	1
3	100.00	1	1	2.01	1.000	30	0.000	Pass	1
4	100.00	1	1	2.01	1.000	30	0.000	Pass	1
5	100.00	1	1	2.01	1.000	30	0.000	Pass	1
6	100.00	1	1	2.01	1.000	30	0.000	Pass	1

9. Save test result

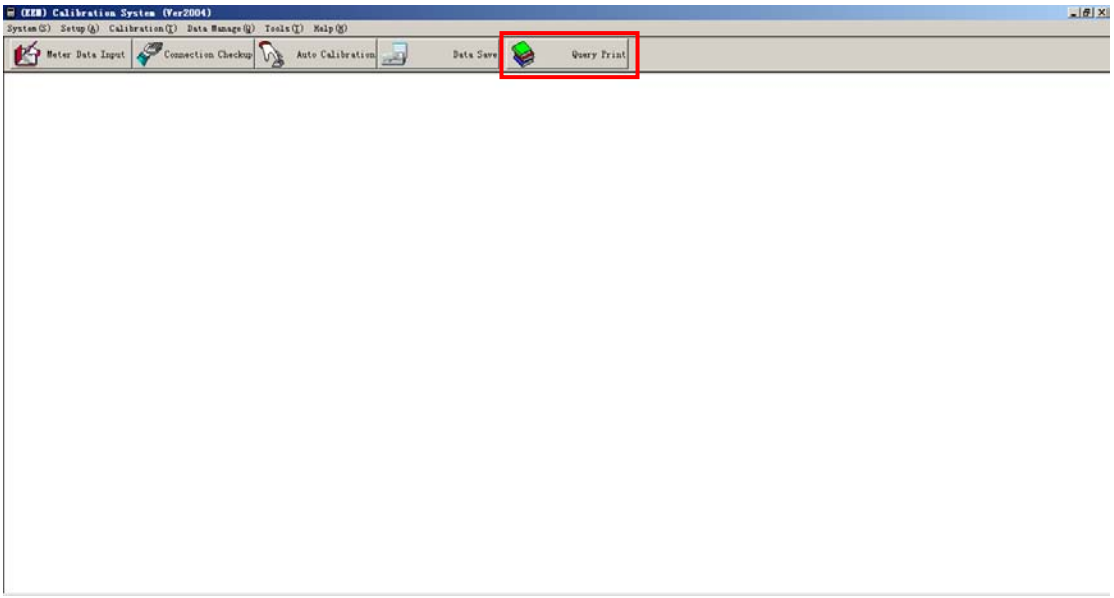


Input the data if needed.

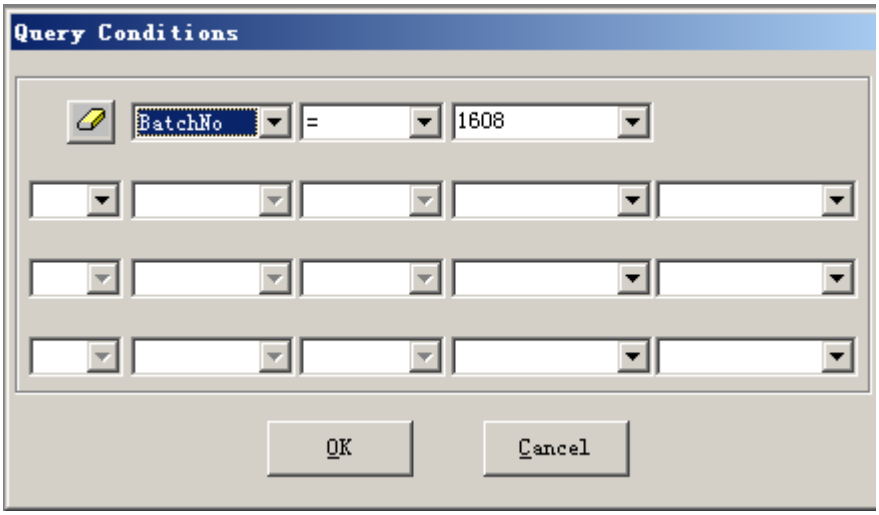


10. Test result query

Click ‘Query Print’ can export the test data.

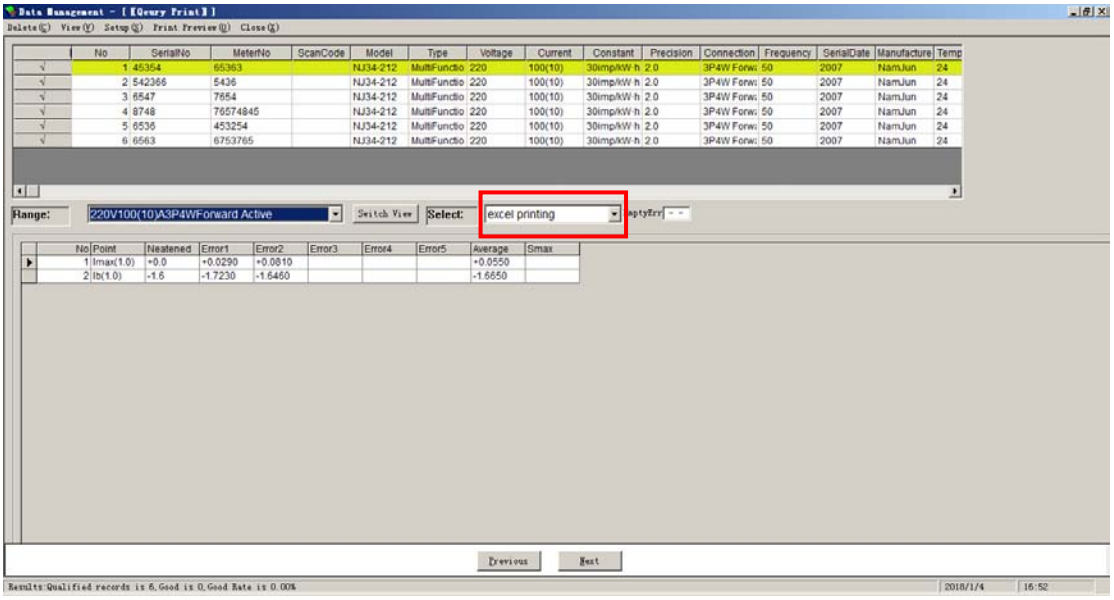


Input the batch number or any other search option.



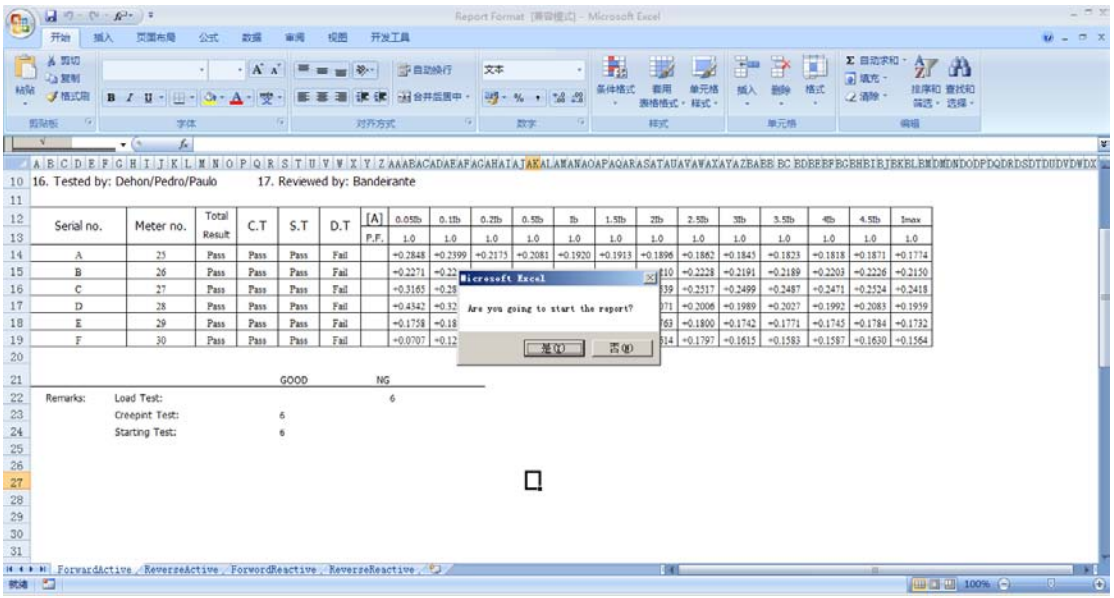
11. Export test result

Select the export format,



11.1. Export to excel format

Click next to export data to excel format file. Excel's macro function must be enabling.



11.2. Export to txt format

File is automatically save to the follow address,

Text Report

1. Model: NJ34-212 2. Test Date: 2018/01/04 3. Huminity: 58 4. Temprature:24

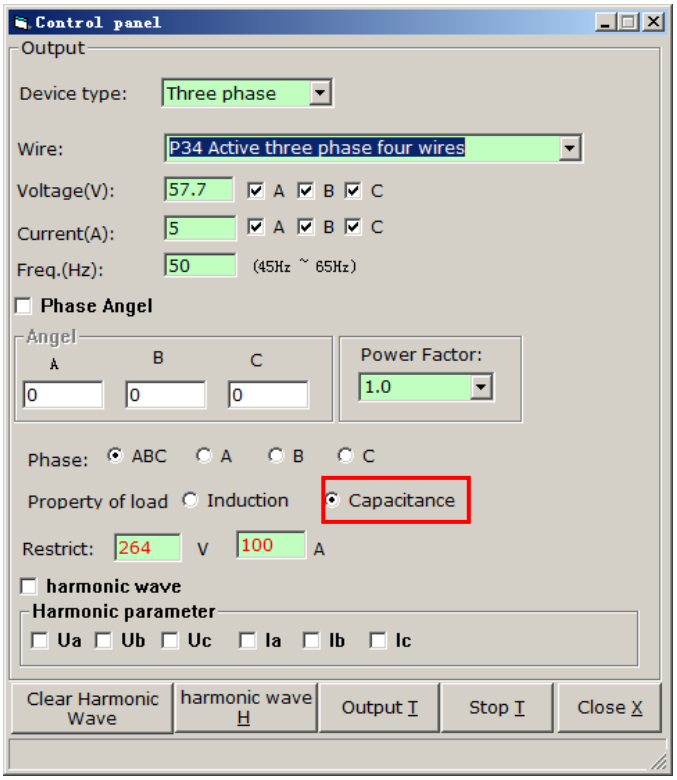
Test Range Info
Connection mode: 3P4WForward Active Voltage: 220V Current: 100(10)A

No.	Serial No.	Meter No.	Conclusion	No load	Start Test	Dial Test	Imax(1.0)	Ib(1.0)
1	45354	65363	Fail	Fail	Fail	Fail	+0.0550	-1.6650
2	542366	5436	Fail	Pass	Pass	Pass	-0.6480	+64.2117
3	6547	7654	Fail	Pass	Pass	Pass	-0.9650	-1.6380
4	8748	76574845	Fail	Pass	Pass	Pass	-0.6975	-0.8563
5	6536	453254	Fail	Pass	Pass	Pass	-0.7200	-0.9893
6	6563	6753765	Fail	Pass	Pass	Pass	-0.4730	-2.7703

12. Source control

12.1. Quick Dive control

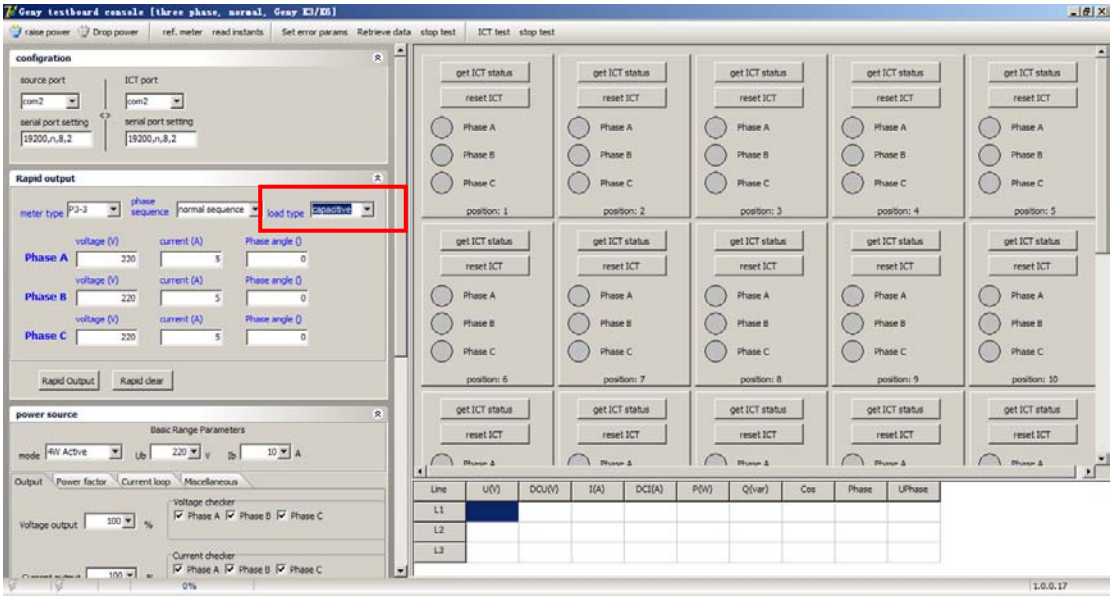
For loading with electric meter, the property of load have to select captive load, otherwise it will causing overload alarm.



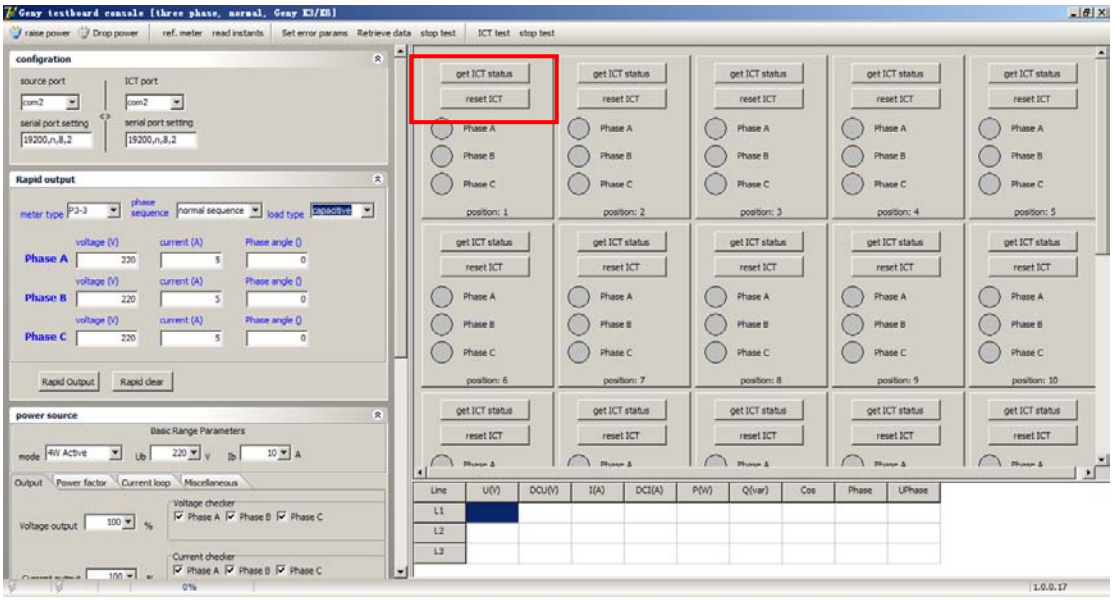
12.2. Source Control Tools

12.2.1. Power source control

For loading with electric meter, the property of load have to select captive load, otherwise it will causing overload alarm.



12.2.2. ICT testing

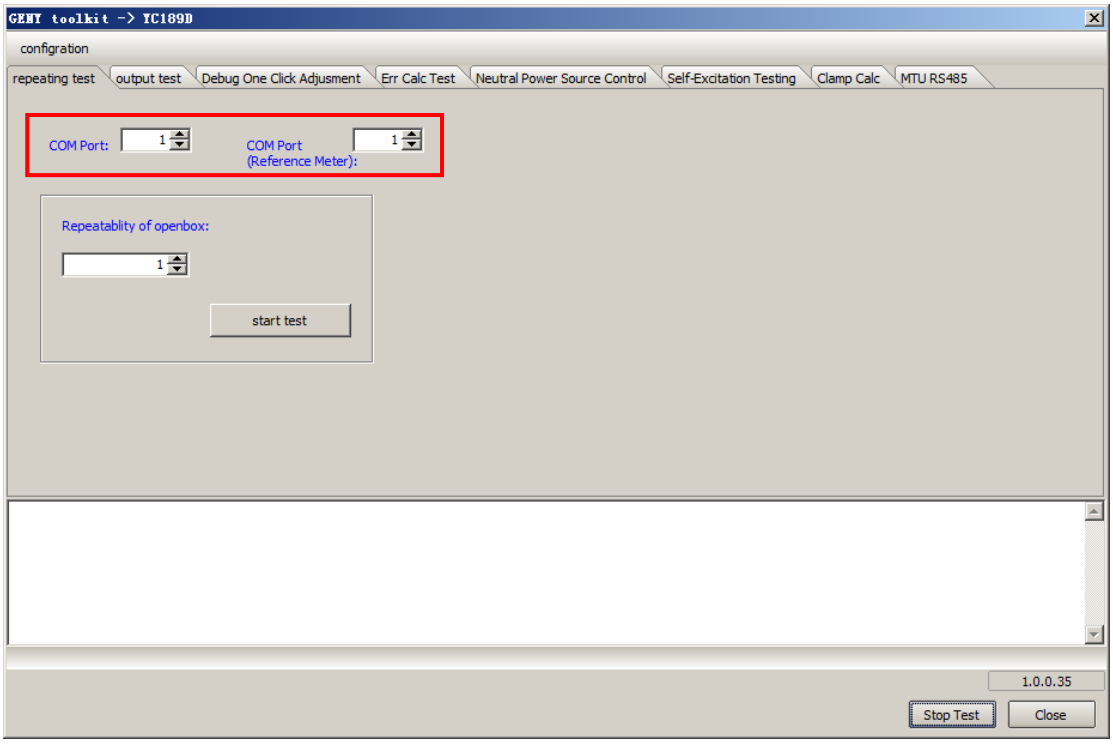


12.3. Toolkits

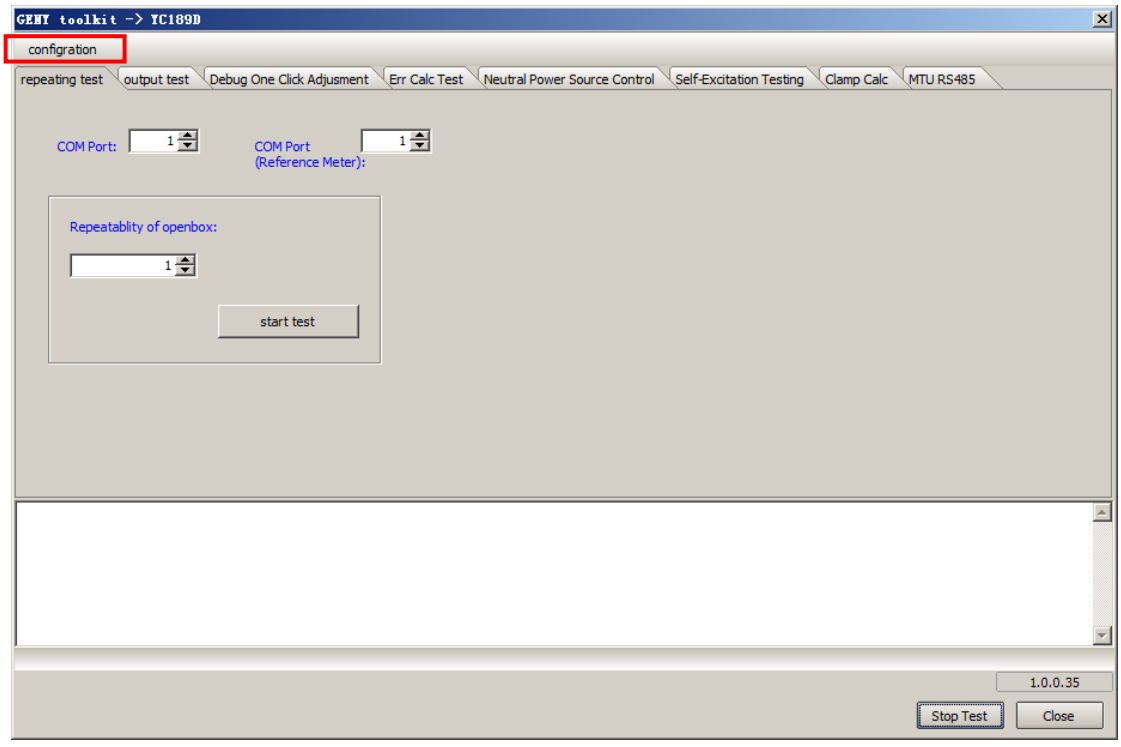
Click the ‘Toolkits’ icon on the desktop or in the installation folder of software.

12.3.1. Configuration 1

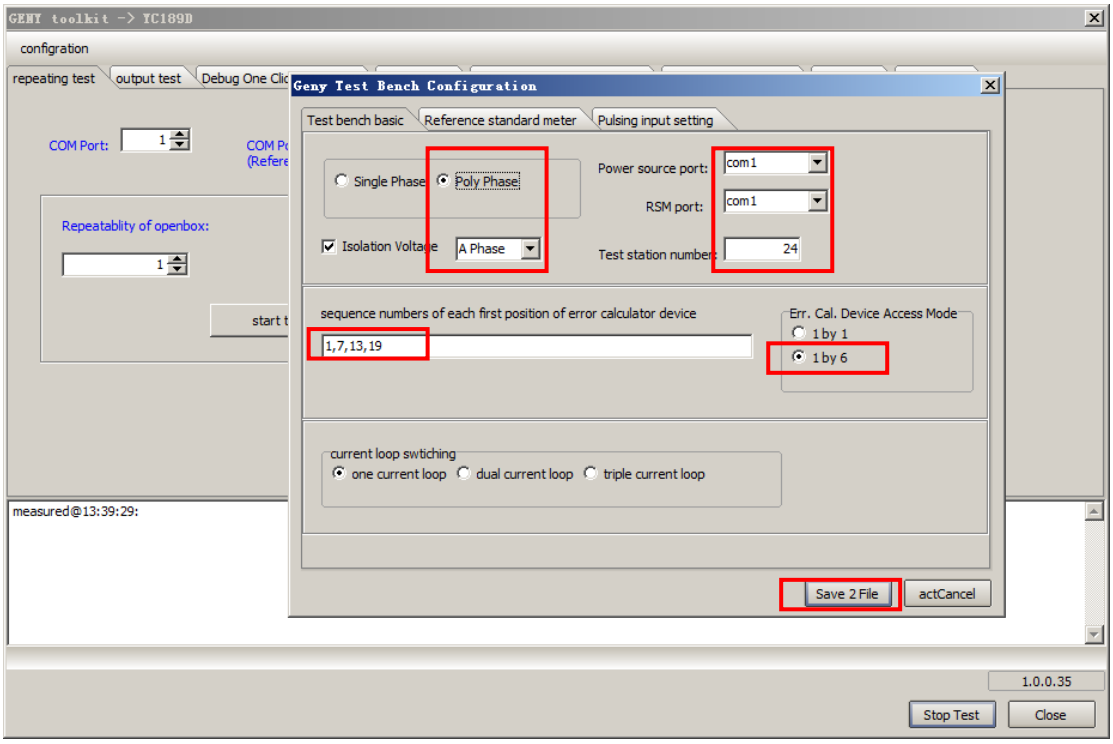
Set the comport of source and reference meter



12.3.2. Configuration 2



Set the comport again, and other configuration

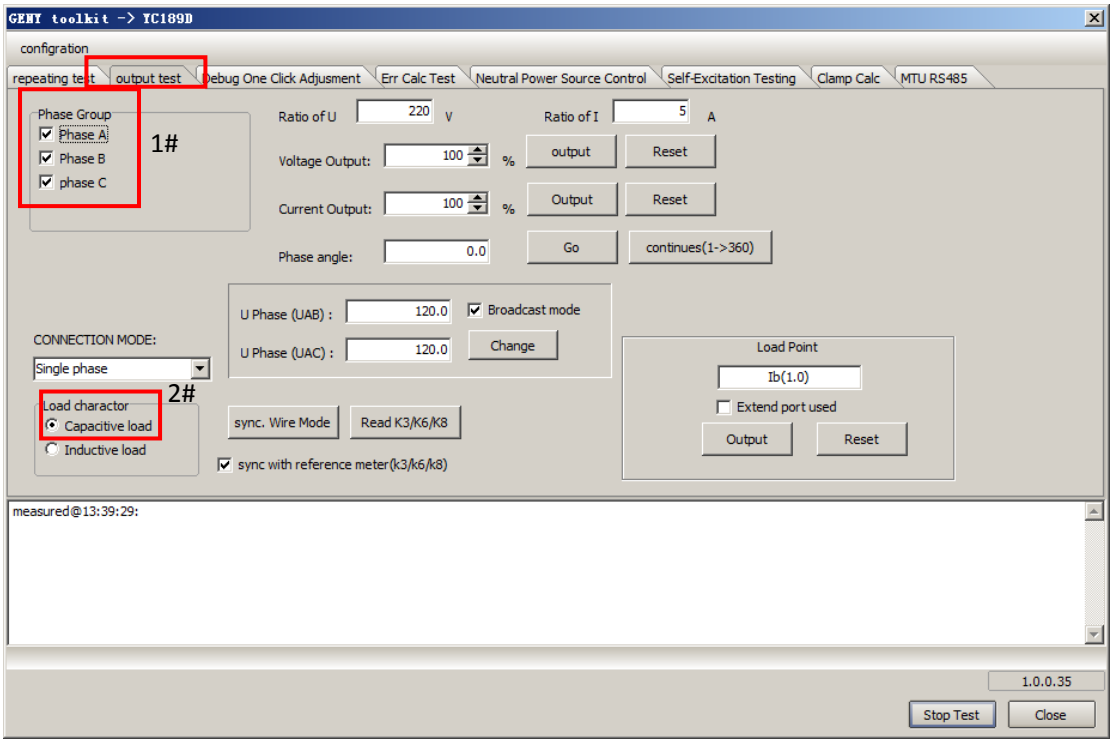


Remark:

Sequence number of each first position of error calculator device is 1,17,13,19 for standard design. Error calculator device access mode is ‘1 by 6’ for standard design.

Please set the program to run as ‘Administrator mode’ when press ‘Save 2 file’ is rejected by windows,

12.3.3. Output test preset

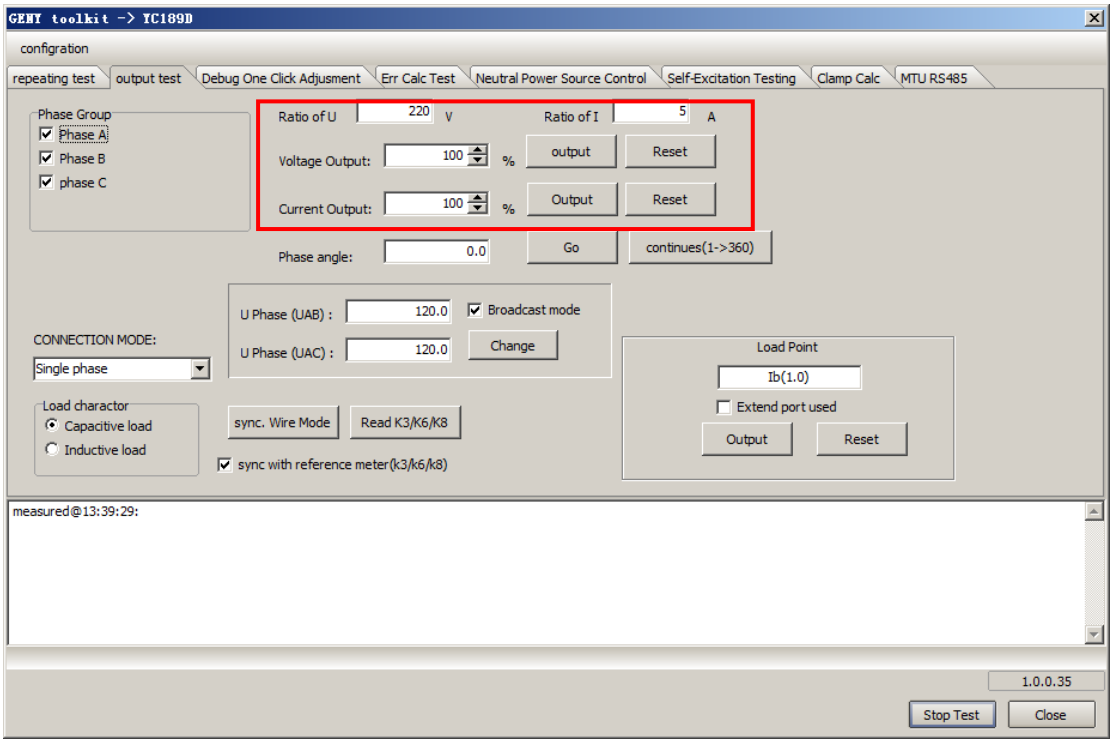


1#	Phase Group	Select the control phase
2#	Load character	For electrical meter, select ‘Capacitive load’. For mechanical meter, select ‘Inductive load’. Source will be overloaded if not select correctly.

12.3.4. Output test of voltage and current

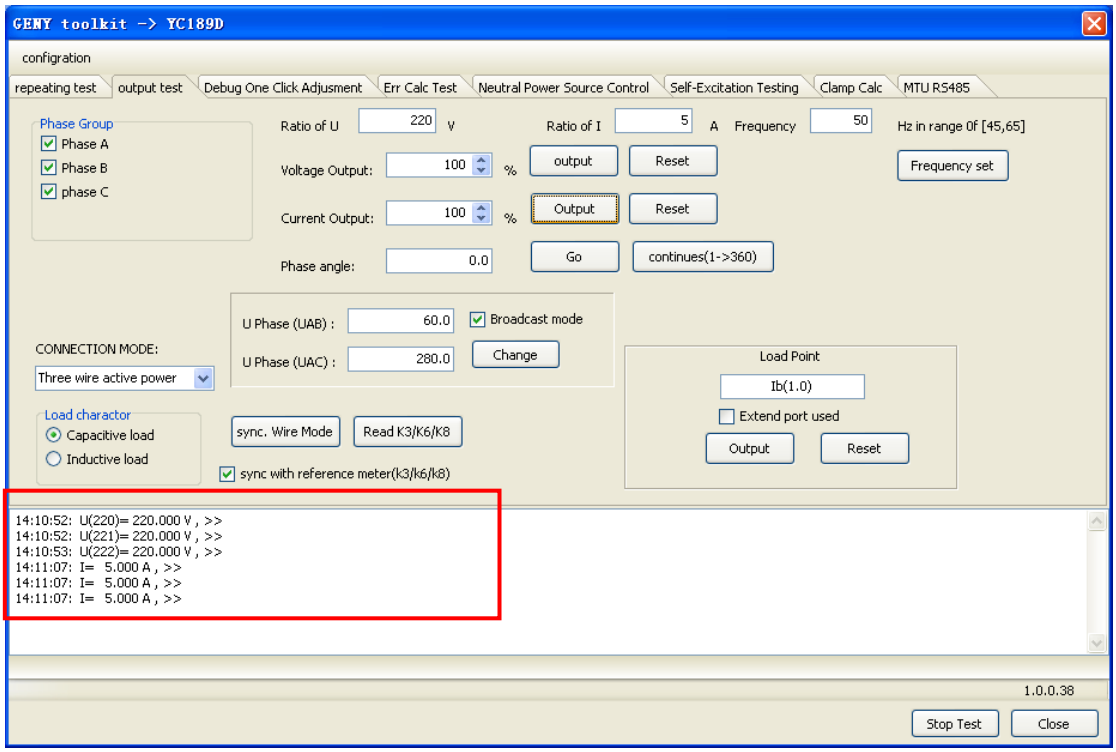
Set first the ratio of voltage and current.

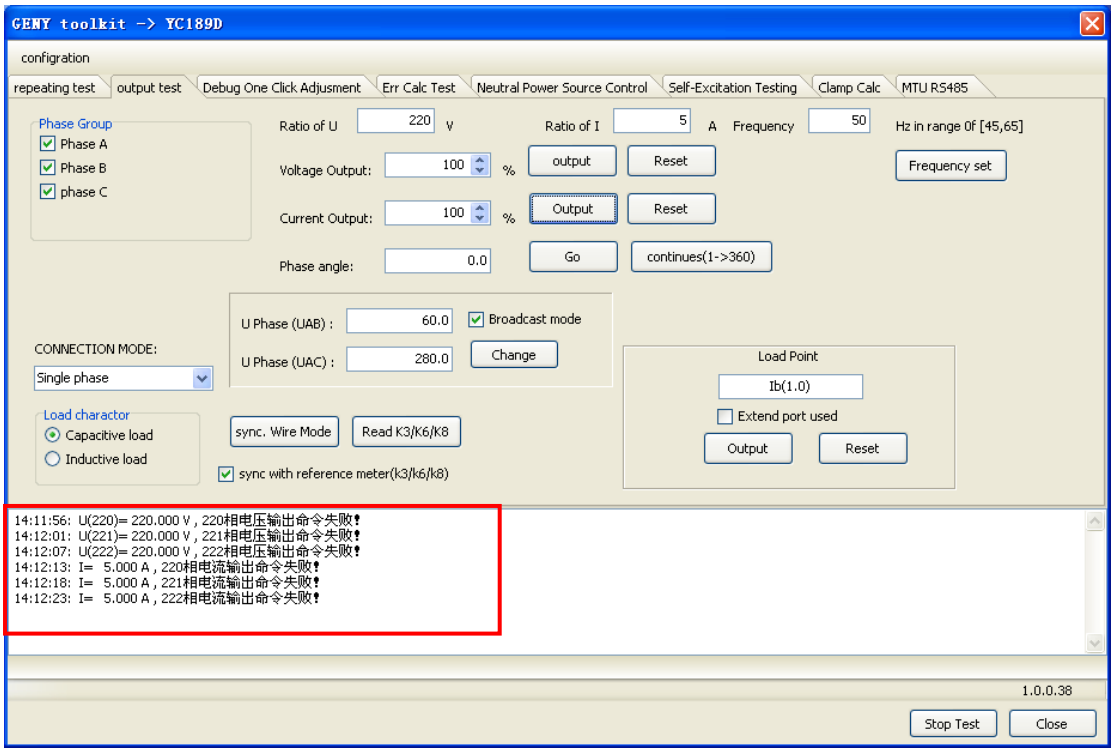
By click on the ‘output’ button to generate voltage and current, ‘reset’ button the drop voltage or current down to zero.



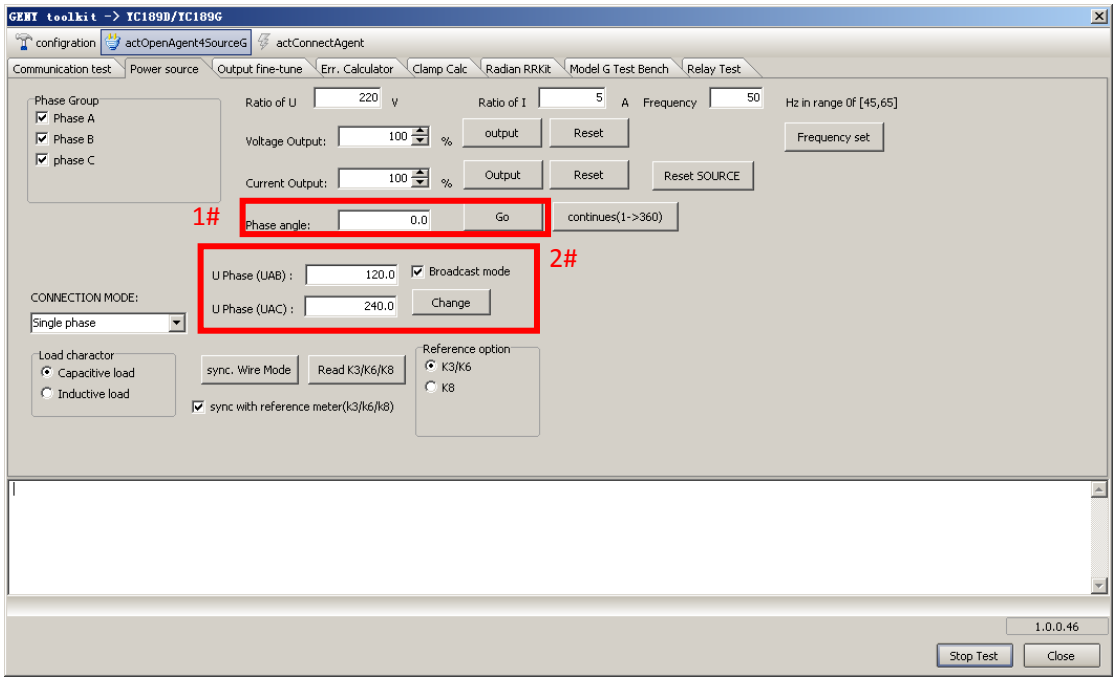
12.3.5. Communication status indication

Communication successful, return message will display as ‘>>’, otherwise it will display as ‘????!’


GENY toolkit -> YC189D
configration
repeating test
output test
Debug One Click Adjusment
Err Calc Test
Neutral Power Source Control
Self-Excitation Testing
Clamp Calc
MTU RS485
Phase Group
Phase A
Phase B
phase C
Ratio of U
220
V
Ratio of I
5
A
Frequency
50
Hz in range 0f [45,65]
Voltage Output:
100
%
output
Reset
Frequency set
Current Output:
100
%
Output
Reset
Phase angle:
0.0
Go
continues(1->360)
U Phase (UAB) :
60.0
Broadcast mode
U Phase (UAC) :
280.0
Change
CONNECTION MODE:
Three wire active power
Load Point
Ib(1.0)
Extend port used
Output
Reset
Load charactor
Capacitive load
Inductive load
sync. Wire Mode
Read K3/K6/K8
sync with reference meter(k3/k6/k8)
14:10:52: U(220)= 220.000 V , >>
14:10:52: U(221)= 220.000 V , >>
14:10:53: U(222)= 220.000 V , >>
14:11:07: I= 5.000 A , >>
14:11:07: I= 5.000 A , >>
14:11:07: I= 5.000 A , >>
1.0.0.38
Stop Test
Close

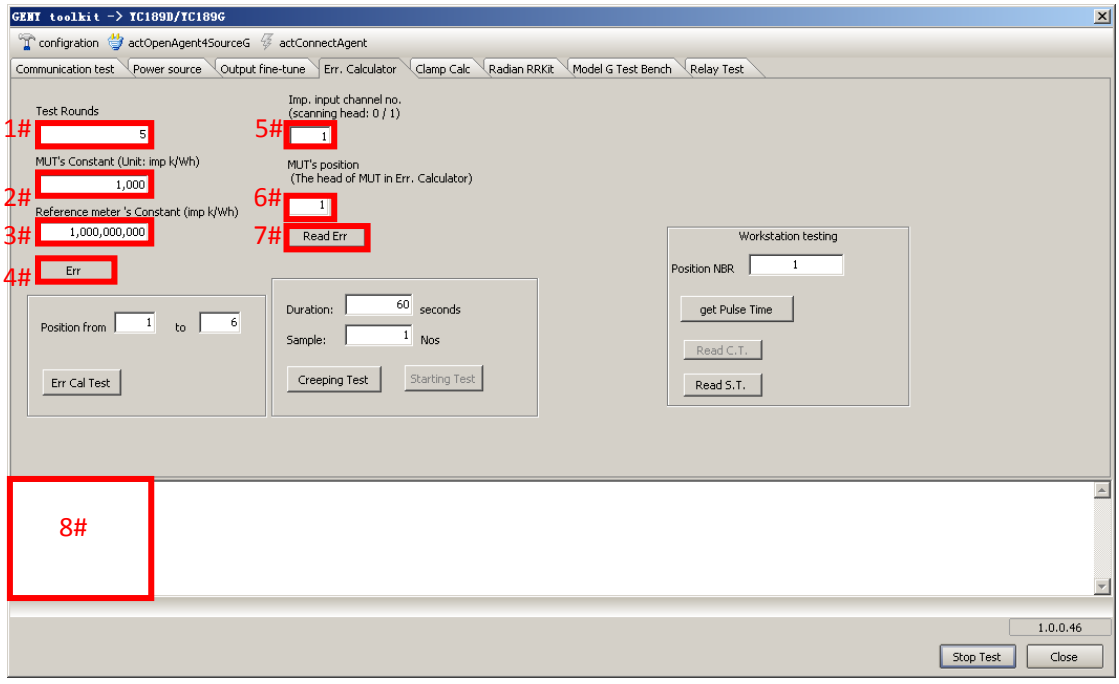

GENY toolkit -> YC189D
configration
repeating test
output test
Debug One Click Adjusment
Err Calc Test
Neutral Power Source Control
Self-Excitation Testing
Clamp Calc
MTU RS485
Phase Group
Phase A
Phase B
phase C
Ratio of U
220
V
Ratio of I
5
A
Frequency
50
Hz in range 0f [45,65]
Voltage Output:
100
%
output
Reset
Frequency set
Current Output:
100
%
Output
Reset
Phase angle:
0.0
Go
continues(1->360)
U Phase (UAB) :
60.0
Broadcast mode
U Phase (UAC) :
280.0
Change
CONNECTION MODE:
Single phase
Load Point
Ib(1.0)
Extend port used
Output
Reset
Load charactor
Capacitive load
Inductive load
sync. Wire Mode
Read K3/K6/K8
sync with reference meter(k3/k6/k8)
14:11:56: U(220)= 220.000 V , 220相电压输出命令失败!
14:12:01: U(221)= 220.000 V , 221相电压输出命令失败!
14:12:07: U(222)= 220.000 V , 222相电压输出命令失败!
14:12:13: I= 5.000 A , 220相电流输出命令失败!
14:12:18: I= 5.000 A , 221相电流输出命令失败!
14:12:23: I= 5.000 A , 222相电流输出命令失败!
1.0.0.38
Stop Test
Close

12.3.6. Phase position (power factor) and phase angle control



1.	Phase angle	Phase position in between voltage and current. Press ‘Go’ button to set the change.
2.	U phase	Voltage phase angle, U phase (UAB) =120, (UAC) =240 by default. Press ‘Change’ button to set the phase angle.

12.3.7. Error testing function

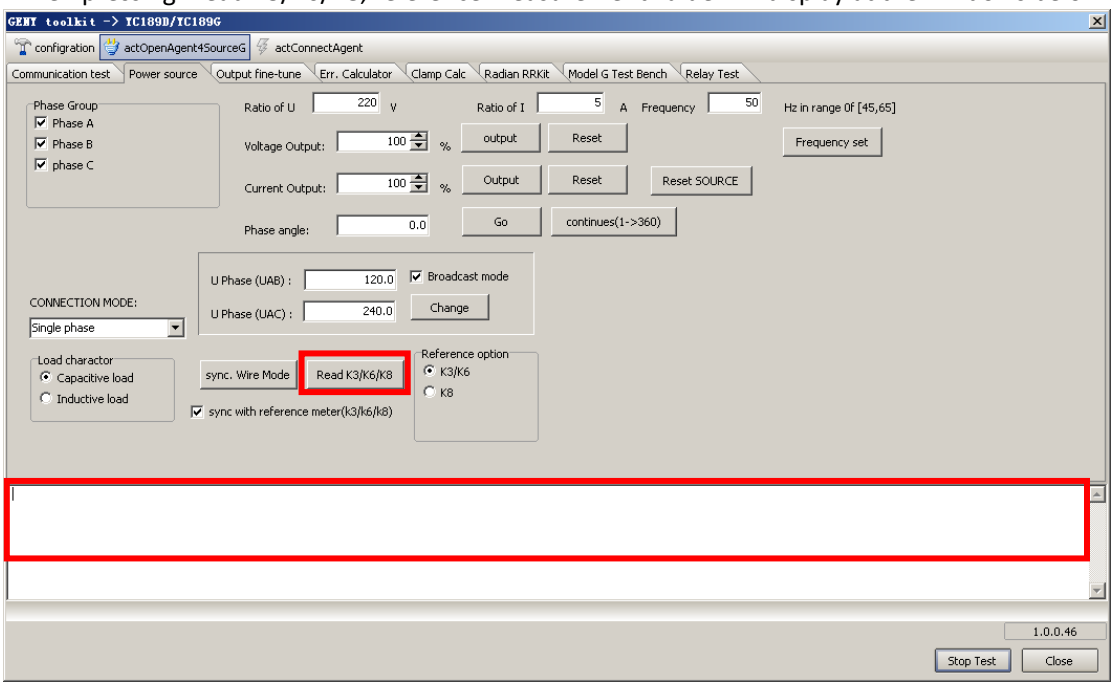


1.	Test Rounds	Pulse circle in the error test

2.	MUT's Constant	Meter's contant
3.	Reference's Constant	0~1A 1,000,000,000 1~10A 100,000,000 10~100A 10,000,000
4.	Err	Set the 1#,2#,3# setting value to error calculator
5.	Imp. Input pulse Channel no.	User's left hand side sensor channel is 9. User's right hand side sensor channel is 1.
6.	MUT's position	In standard design, even six meter in connect with one error calculator. When software try to read the error of error calculator, it will start call from the first meter of the error calculator, usually they are; 1, 7, 13, 19 meter position.
7.	Read error	Error result on meter rack will return to software window 8#

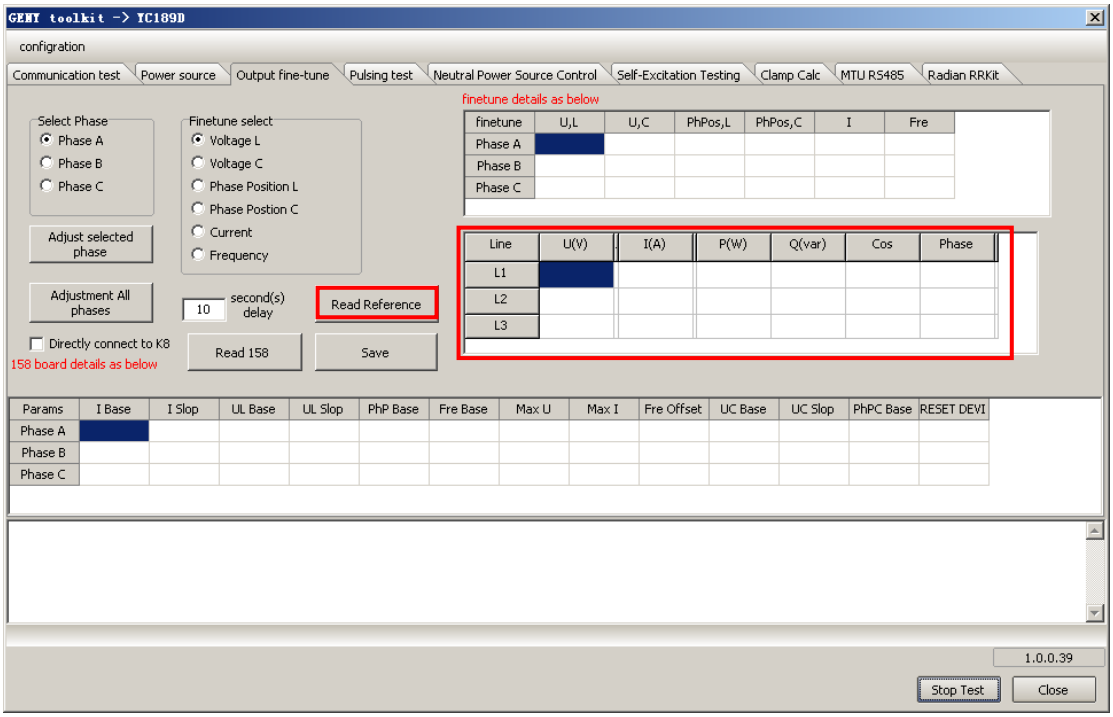
12.3.8. Standard meter communication test 1

When pressing 'Read K3/K6/K8, reference measurement value will display at the windows below.



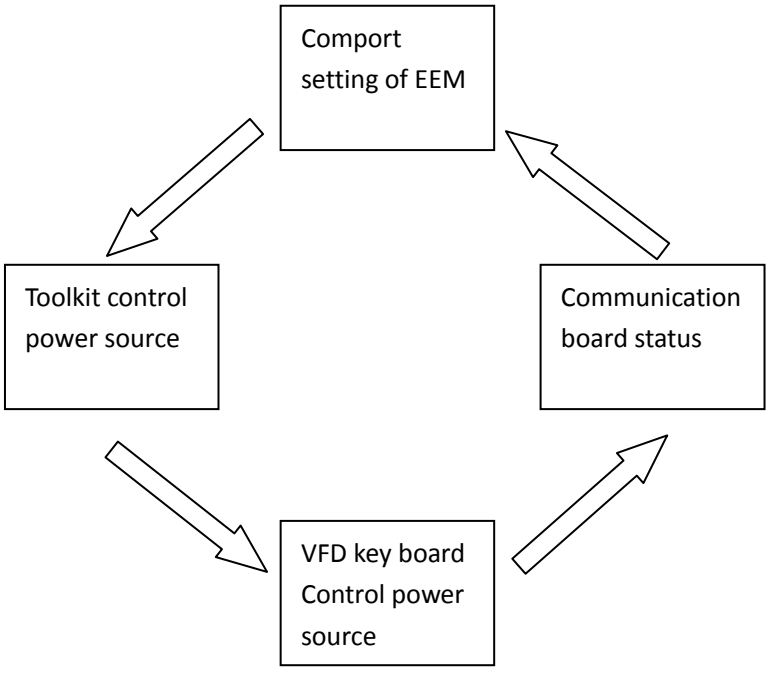
12.3.9. Standard meter communication test 2

Press the read Reference button, the reference display parameter will feed into the software.



13. Trouble shooting

13.1. Power source no respond by EEM software



13.2. Test could not start

RSM communication comport setting incorrect

13.3. Division by zero

This message indications the software not able to read the constant of RSM.

13.4. No have feedback error

Error calculator setting issue