

文档更新说明:

1. Cam-107 线缆损坏, 换成 Cam-122;
2. Cam-3, Cam-4 配置过程中, 增加两个步骤

Operation manual for the ISCMOS sub-system
of HERD full-functional prototype at CERN Beam Test 2021 (V0.1)

CONTENTS

1	Introduction.....	1
1.1	Introduction of the ISCMOS sub-system.....	1
1.2	Purposes of BT for ISCMOS sub-system.....	1
2	Hardware.....	2
2.1	Unpacking.....	2
2.2	On-site transportation and connection.....	3
2.3	Packing.....	13
3	Control software.....	14
3.1	Introduction.....	14
3.2	Normal operations.....	14
3.2.1	Pre-test outside the beam area before beam test.....	14
3.2.2	Particle run.....	23
3.2.3	Calibration run.....	30
3.2.4	Test outside the beam area after beam test.....	30
3.3	Abnormal operations.....	30
4	Conclusion.....	30

1 Introduction

1.1 Introduction of the ISCMOS sub-system

Figure 1- 1 Illustration of ISCMOS sub-system

Table 1- 1 Device list of ISCMOS sub-system

No.	Device name	Function
1.	ISCMOS system	image and data acquisition
2.		

*

1.2 Purposes of BT for ISCMOS sub-system

The ISCMOS sub-system is used for the image and data acquisition. This sub-system is marked as Cam, consists of two ISCMOS devices, one ISCMOS IMAQ computer, two power devices, two temp control devices, computer monitor, mouse, keyboard, many cables and other backup devices. Two ISCMOS have been fixed to main HERD-device, trig-line from the trigger system. ISCMOS IMAQ computer used for telework, should be connected to the network. Detailed information is provided as below.

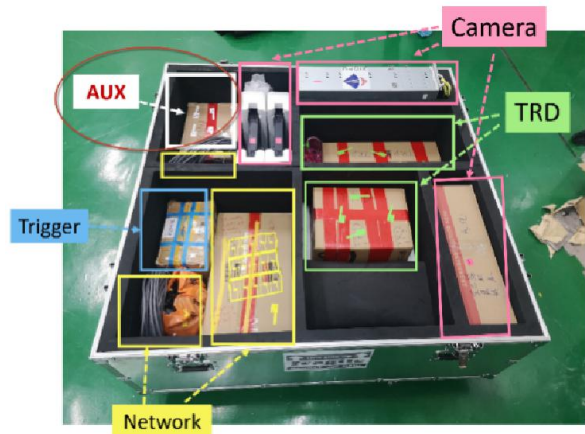
Device NO.	Device Name	
Cam-1	ISCMOS 1#	
Cam-2	ISCMOS 2#	
Cam-3	ISCMOS Power 1#	
Cam-4	ISCMOS Power 2#	
Cam-5	ISCMOS Temp Control 1#	
Cam-6	ISCMOS Temp Control 2#	
Cam-7	ISCMOS IMAQ Computer	
Cam-8	Computer monitor	
Cam-9	Computer Keyboard	
Cam-10	Computer Mouse	
Cam-11	ISCMOS Temp Control 3#	backup
Cam-12	USB HUB	
Cam-13	Download Device	backup
Cam-14	Power Plug Board	

2 Hardware

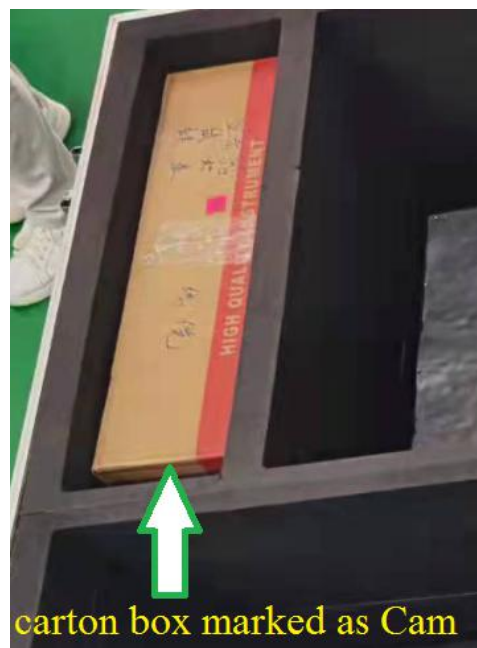
2.1 Unpacking

These are four parts of ISCMOS system packaged in this box, marked as Cam (carton box), Cam-3, Cam-4, and Cam-7.

1. Pull the Cam-7 “ISCMOS IMAQ 01” out of the box.



2. Pull out the ISCMOS power Cam-3 and Cam-4.
3. Pull out the carton box marked as Cam. Temp control devices, computer monitor, mouse, keyboard, cables and other backup devices of ISCMOS are all in this box.



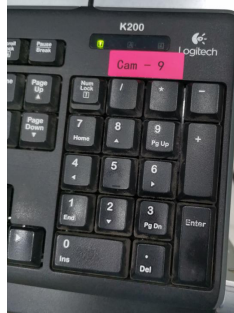
2.2 On-site transportation and connection

Connect order of all the cables as the table. The first part is the cables internal ISCMOS system should be connected. The second part is from other sub-system, trigger and network. The last part is for backup, don't need to connect.

Cable NO	Line Order			
Cam-101	A to Cam-3	B to Cam-1	C to Cam-5	D to ground
Cam-102	A to Cam-1	B to Cam-7 AQ-01		
Cam-103	A to Cam-5	B to Cam-1		
Cam-104	A to Cam-5	B to Cam-12 Hub1		
Cam-105	A to Cam-3	B to Cam-12 Hub2		
Cam-106	A to Cam-4	B to Cam-2	C to Cam-6	D to ground
Cam-122	A to Cam-2	B to Cam-7 AQ-02		
Cam-108	A to Cam-6	B to Cam-2		
Cam-109	A to Cam-6	B to Cam-12 Hub3		
Cam-110	A to Cam-4	B to Cam-12 Hub4		
Cam-111	A to Cam-14	B to Cam-7 Power1		
Cam-112	A to Cam-14	B to Cam-7 Power2		
Cam-113	A to Cam-14	B to Cam-8		
Cam-114	A to Cam-8	B to Cam-7 VGA		
Cam-115	A to Cam-12	B to Cam-7 USB1		
Cam-126	A to Cam-14	B to Cam-3		
Cam-127	A to Cam-14	B to Cam-4		
Cam-9	To Cam-7 USB3			
Cam-10	To Cam-7 USB4			
Cam-14	To main power			
Trig-102B	To Cam-2			
Trig-101A	To Cam-1			
network LAN cable	To Cam-7 LAN			
Cam-116	backup			
Cam-117	backup			
Cam-118	backup			
Cam-119	backup			
Cam-120	backup			
Cam-121	backup			
Cam-107	backup			
Cam-123	backup			
Cam-124	backup			
Cam-125	backup			

Detailed connect order and described picture as below

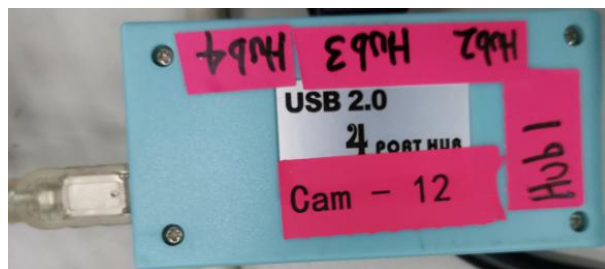
1. Places Cam-3, Cam-4, Cam-5, Cam-6, Cam-7, Cam-8 clear to the Cam-1 and Cam-2, and keep distance about 1m.
2. Take out the power plug board Cam-14, and connect to the main power of lab.
3. Connect Cam-9 to USB3 port of Cam-7.



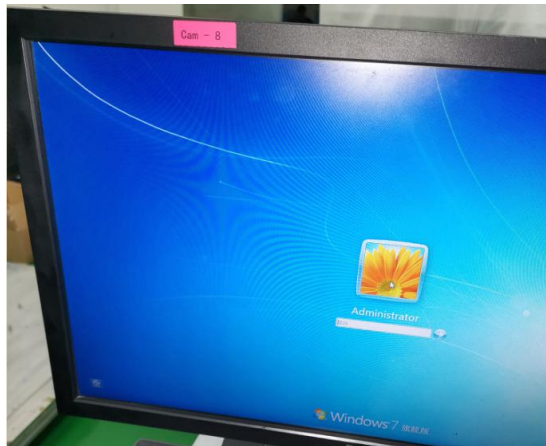
4. Connect Cam-10 to USB4 port of Cam-7.



5. Take out the USB HUB Cam-12, then connect port A of cable Cam-115 to Cam-12 and connect port B of cable Cam-115 to USB1 of Cam-7.

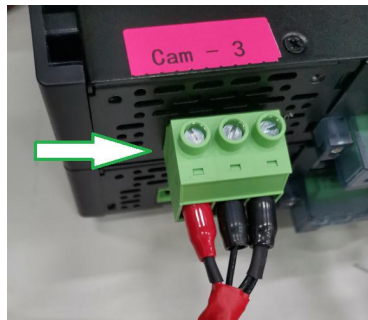


6. Connect port A of cable Cam-114 to Cam-8, and Connect port B to the VGA of Cam-7.

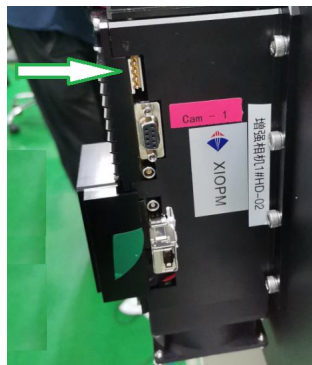


7. Connect port A of cable Cam-113 to Cam-14, and Connect port B to Cam-8.
8. Take out the cable Cam-101:

Connect port A of Cam-101 to power Cam-3;



Connect port B of Cam-101 to ISCMOS Cam-1;

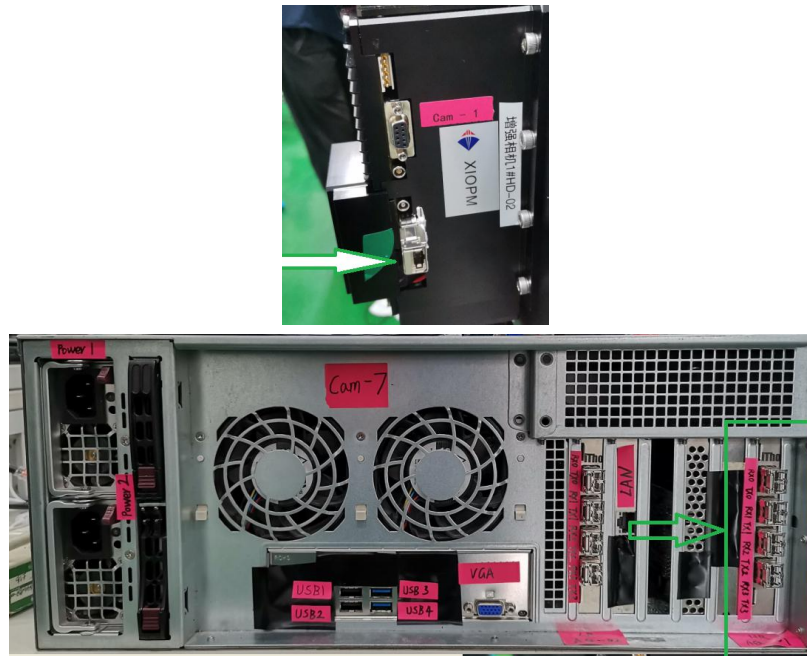


Connect port C of Cam-101 to Temp control Cam-5;



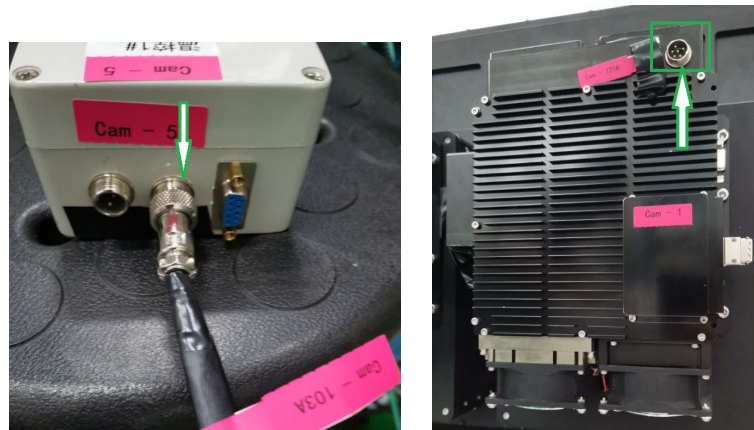
Connect port D of Cam-101 to main ground of the lab, this step is must for the reliability of whole ISMCOS system.

9. Connect port A of cable Cam-102 to Cam-1, and connect B to the AQ-01 port of Cam-7. The sequence of AQ-01 as below, from top down is RX0,TX0,RX1,TX1,RX2,TX2,RX3,TX3.





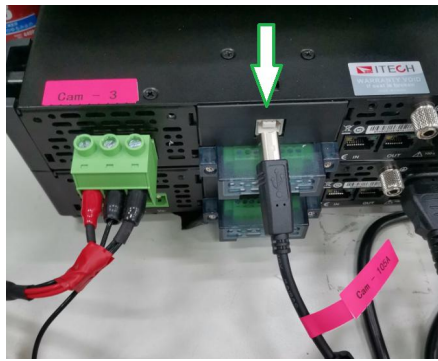
10. Connect port A of cable Cam-103 to Cam-5, and connect B to the Cam-1.



11. Connect port A of cable Cam-104 to Cam-5, and connect B to the Hub1 port of Cam-12.



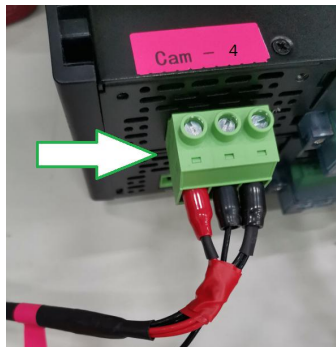
12. Connect port A of cable Cam-105 to Cam-3, and connect B to the Hub2 port of Cam-12.



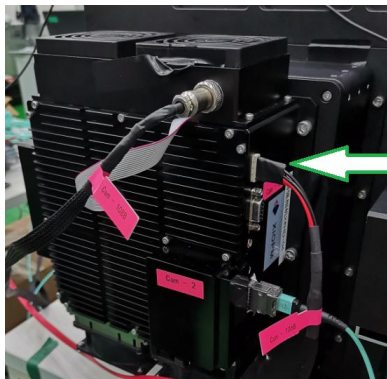
13- 17 is step to ISCMOS 2, similar as step 8-12

13. Take out the cable Cam-106:

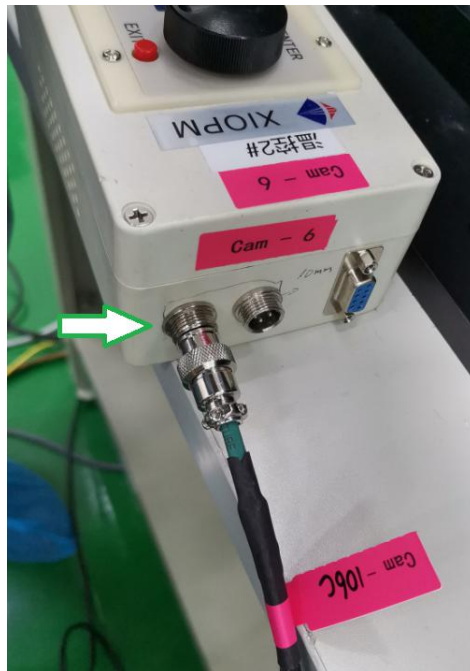
Connect port A of Cam-106 to power Cam-4;



Connect port B of Cam-106 to ISCMOS Cam-2;

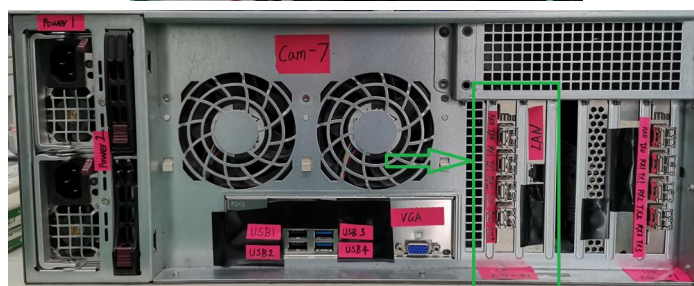
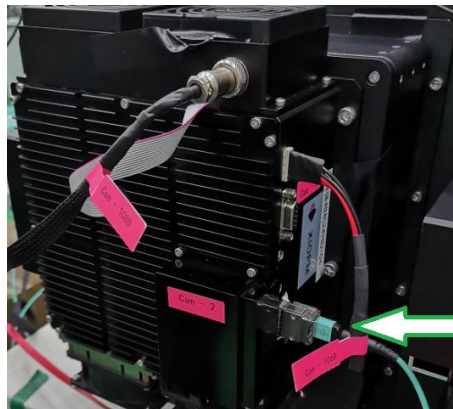


Connect port C of Cam-106 to Temp control Cam-6;



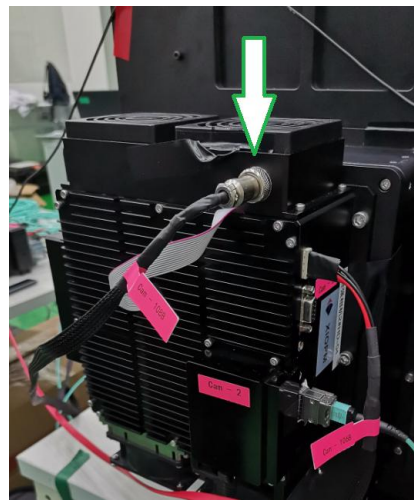
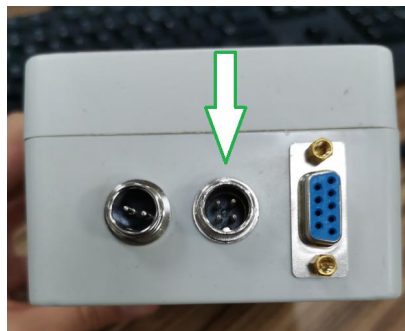
Connect port D of Cam-106 to main ground of the lab, this step is must for the reliability of whole ISMCOS system.

14. Connect port A of cable Cam-122 to Cam-2, and connect B to the AQ-02 port of Cam-7. The sequence of AQ-02 as below, from top down is RX0,TX0,RX1,TX1,RX2,TX2,RX3,TX3.





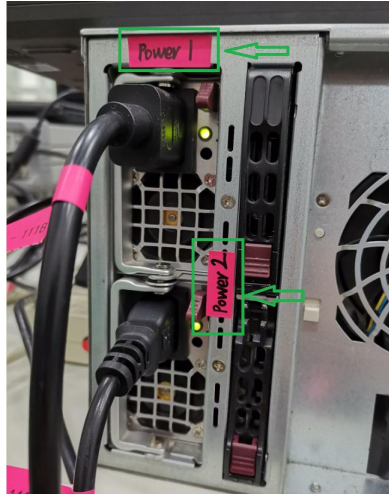
15. Connect port A of cable Cam-108 to Cam-6, and connect B to the Cam-2.



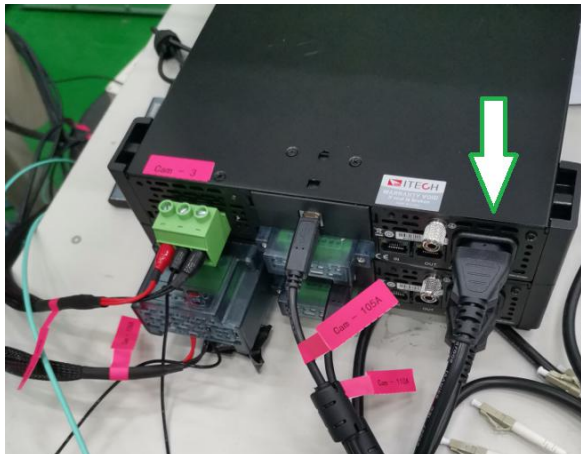
16. Connect port A of cable Cam-109 to Cam-6, and connect B to the Hub3 port of Cam-12.



17. Connect port A of cable Cam-110 to Cam-4, and connect B to the Hub4 port of Cam-12.
18. Connect port A of cable Cam-111 to Cam-14, and connect B to the POWER 1 port of Cam-7.



19. Connect port A of cable Cam-112 to Cam-14, and connect B to the POWER 2 port of Cam-7.
20. Connect port A of cable Cam-126 to Cam-14, and connect B to the Cam-3.



21. Connect port A of cable Cam-127 to Cam-14, and connect B to the Cam-4.
22. Connect port A of cable Trig-101 to Cam-1.



23. Connect port B of cable Trig-102 to Cam-2.



24. Connect network switch to the LAN port of Cam-7, the cable number refer to “network configuration document”.

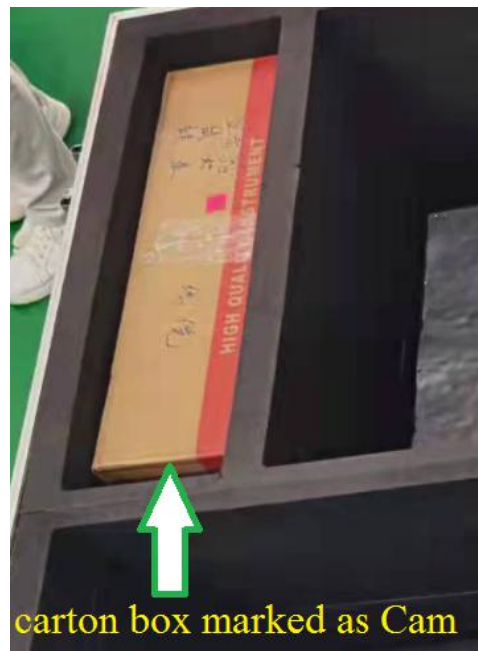


2.3 Packing

1. Pull out all the cables, labeled from Cam-101 to Cam-127, and disconnect all the devices.
2. Place the Cam-7 “ISCMOS IMAQ 01” into the box, as below.



3. Place power Cam-3 and Cam-4 into the box.
4. Place temp control devices, computer monitor, mouse, keyboard, cables and other backup devices of ISCMOS in the box.



3 Control software

3.1 Introduction

The control software of ISCMOS system consists of three kinds, power, temp control, and IMAQ. All of software has been installed in the Cam-7 computer device.

3.2 Normal operations

3.2.1 Pre-test outside the beam area before beam test

Part1. Power On

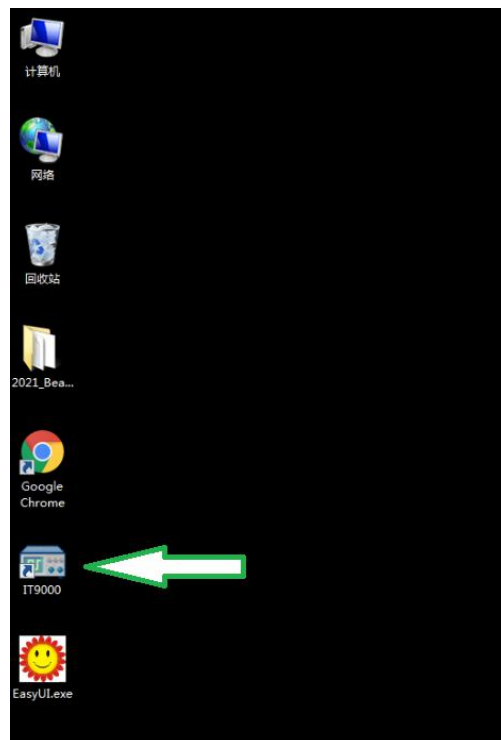
Connecting the power and ground, then we could control power on or down after press the boot button.

Detailed operation:

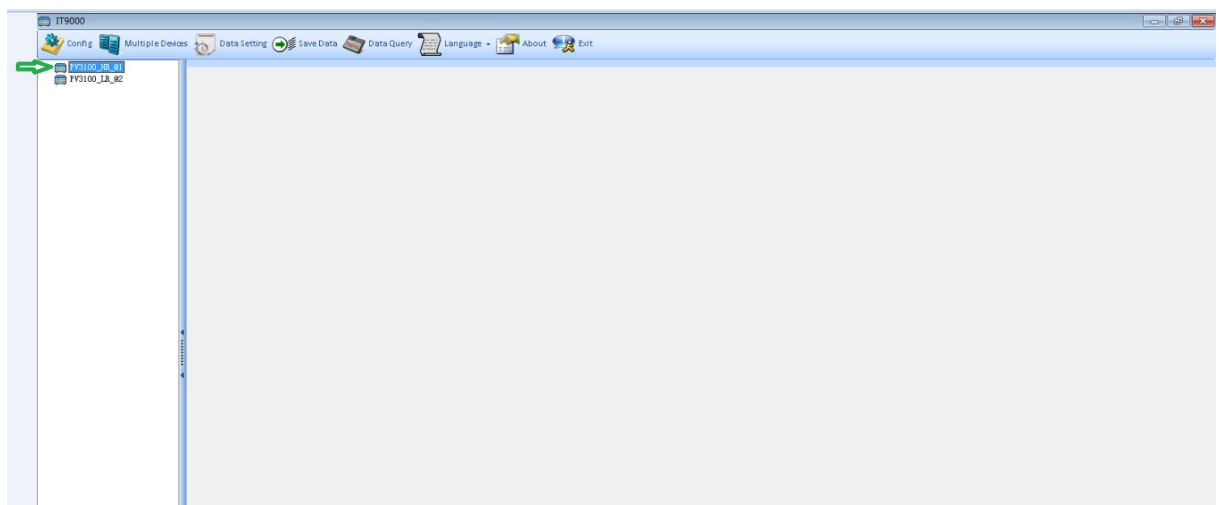
1. Power on the plug board Cam-14.
2. Power on the monitor Cam-8.
3. Power on the ISCMOS IMAQ Cam-7, password of the system is herd2021.
4. Make sure the GND line of ISCMOS power devices Cam-3 and Cam-4 have been connected to main ground, then press the boot button.



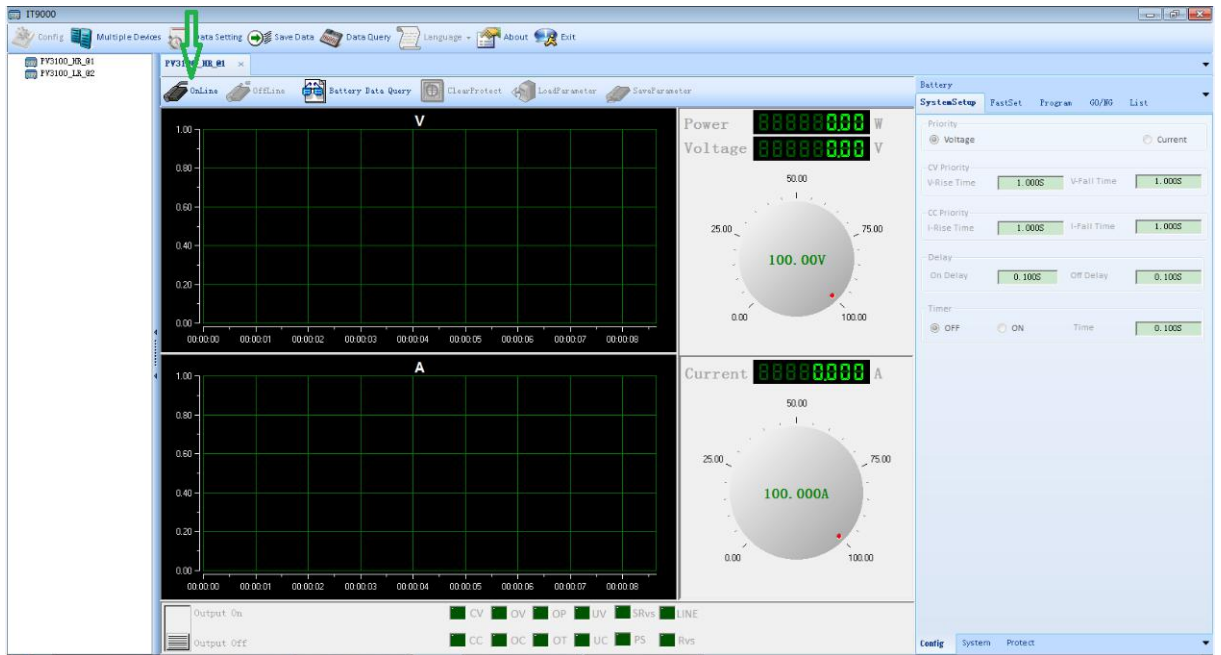
5. Run the progress IT9000 on the desktop of Cam-7.



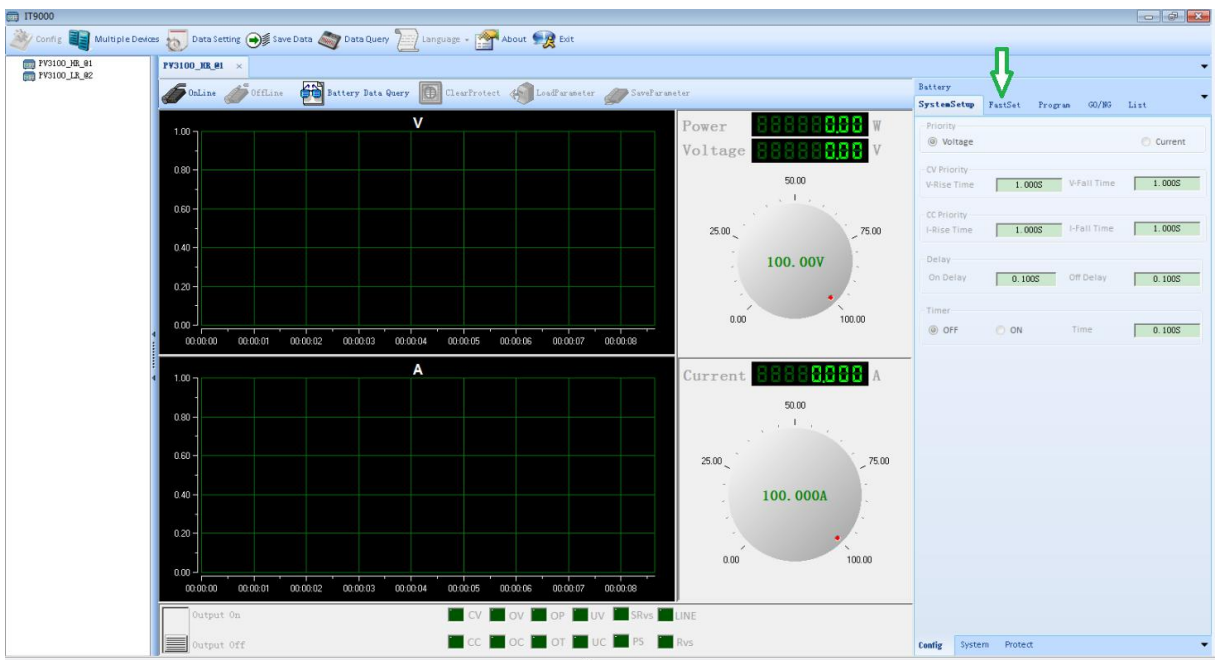
6. Click PV3100_HR_@1.



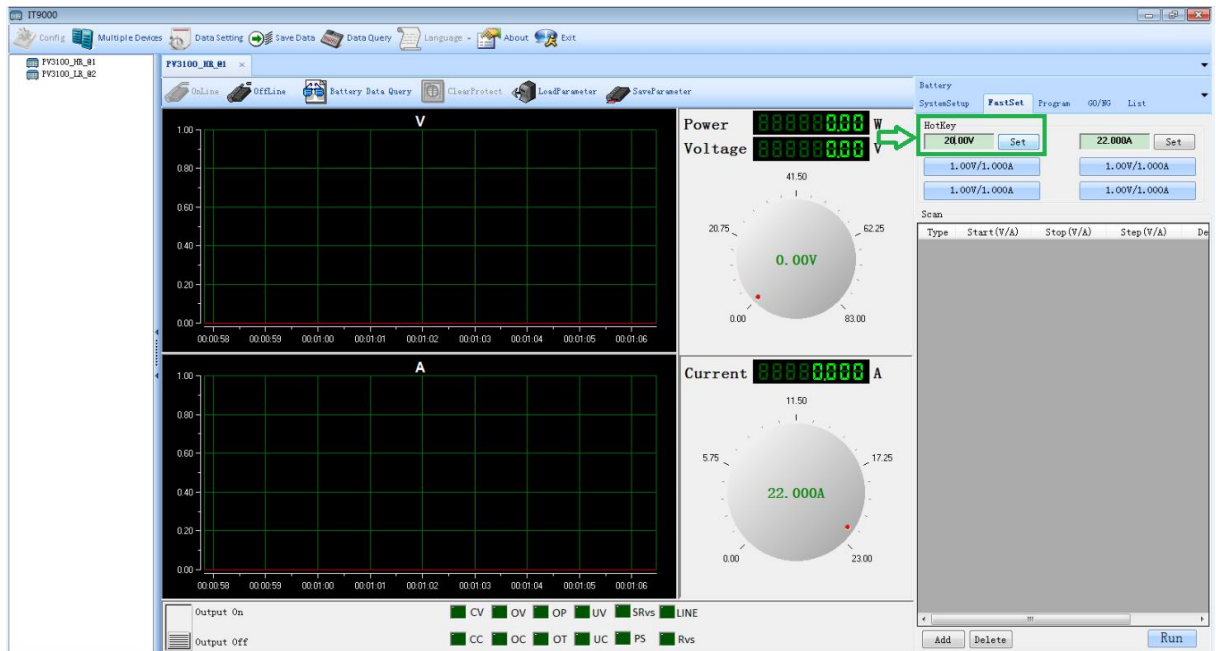
7. Click Online



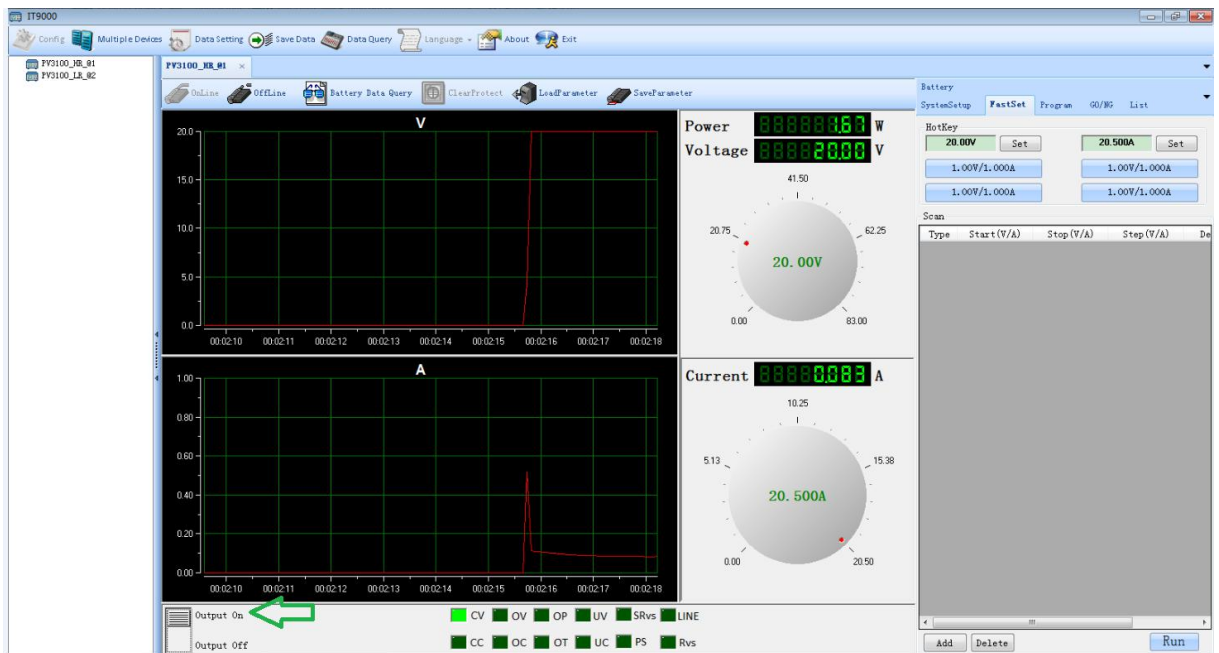
8. Click FastSet.



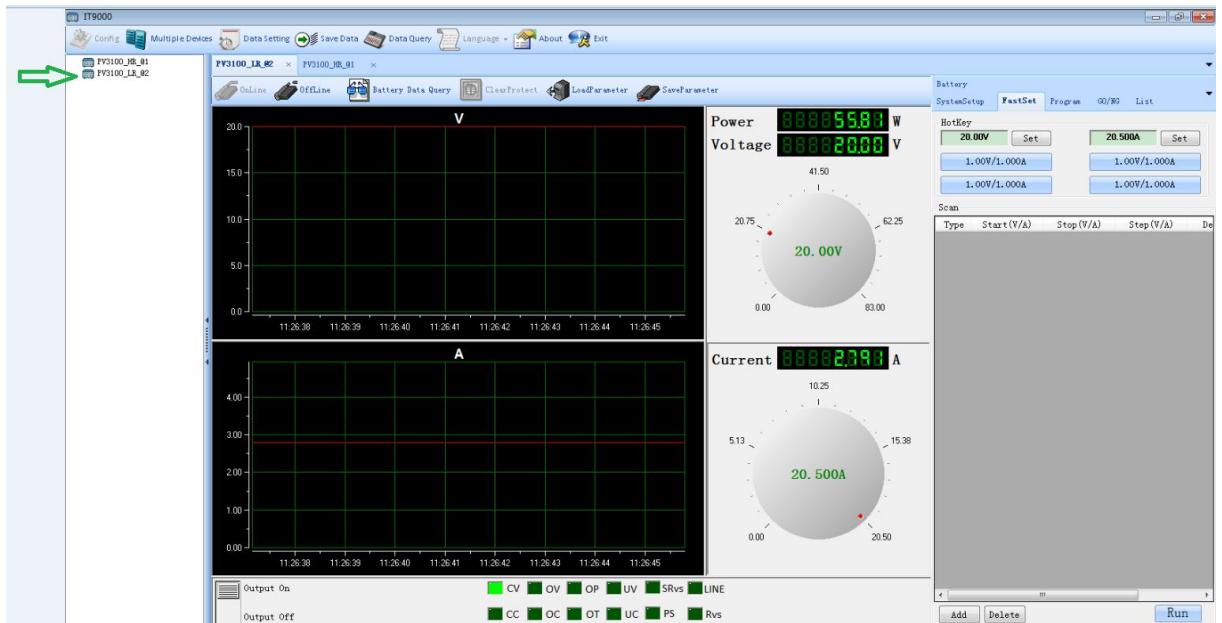
9. Set HotKey to 20V, and click Set.



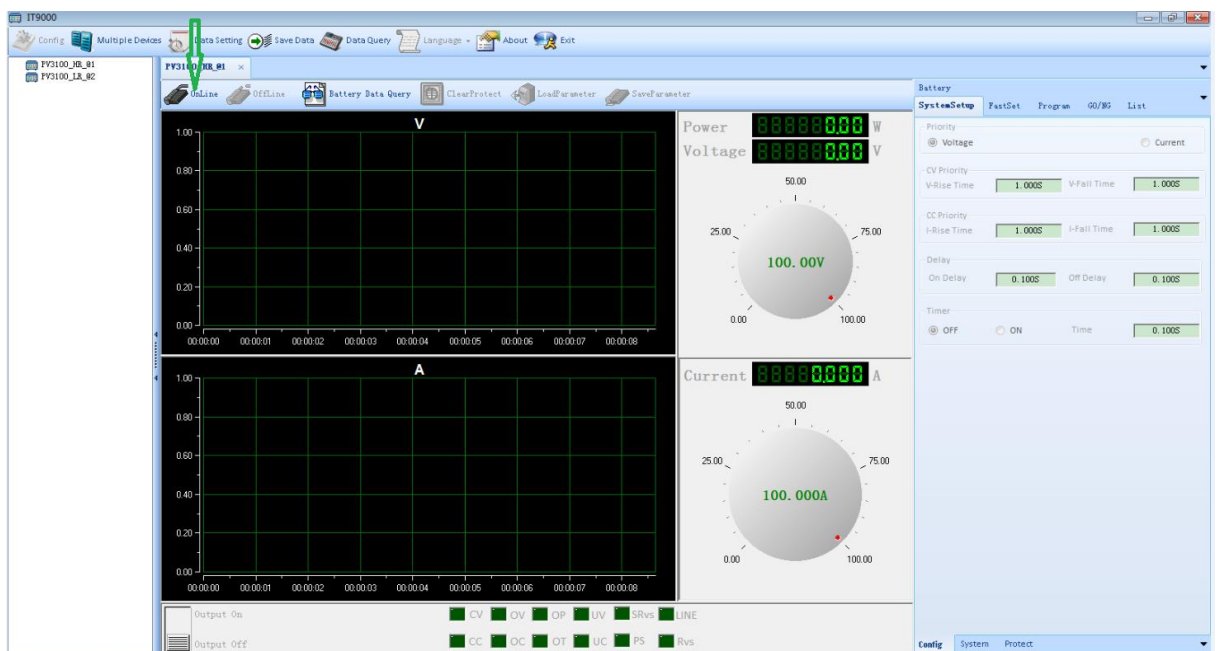
10. Click Output On. The power of ISCMOS1 is ok, when the red line in V- graph rush to 20V



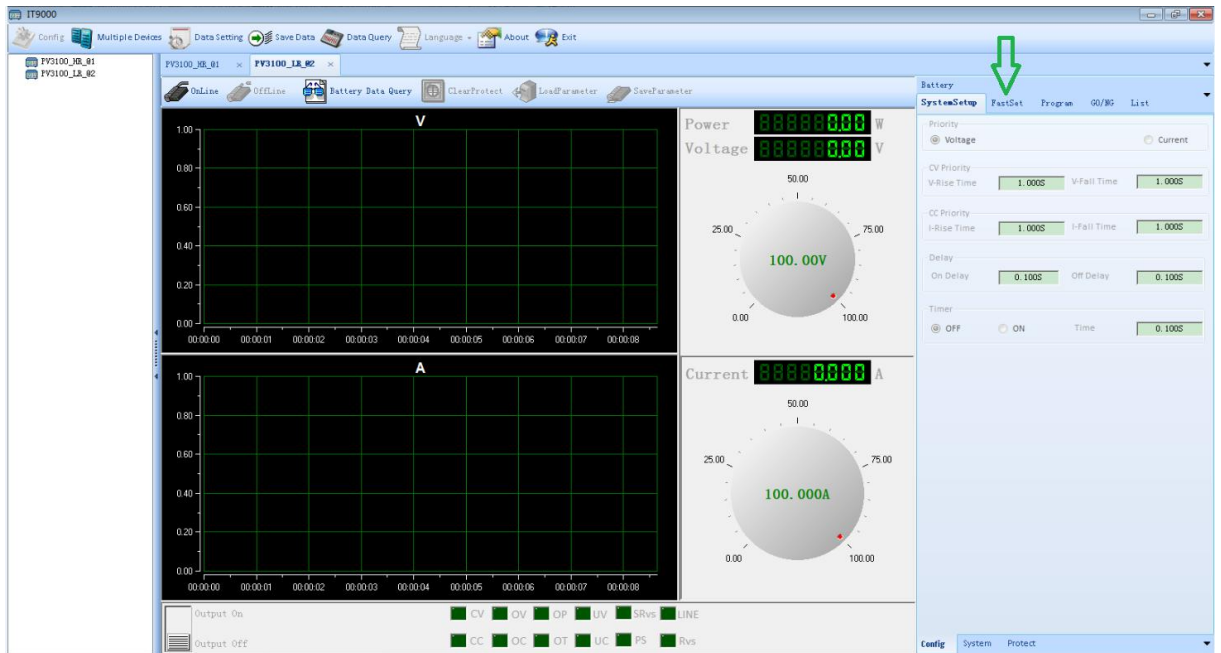
11. Click PV3100_LR_@2.



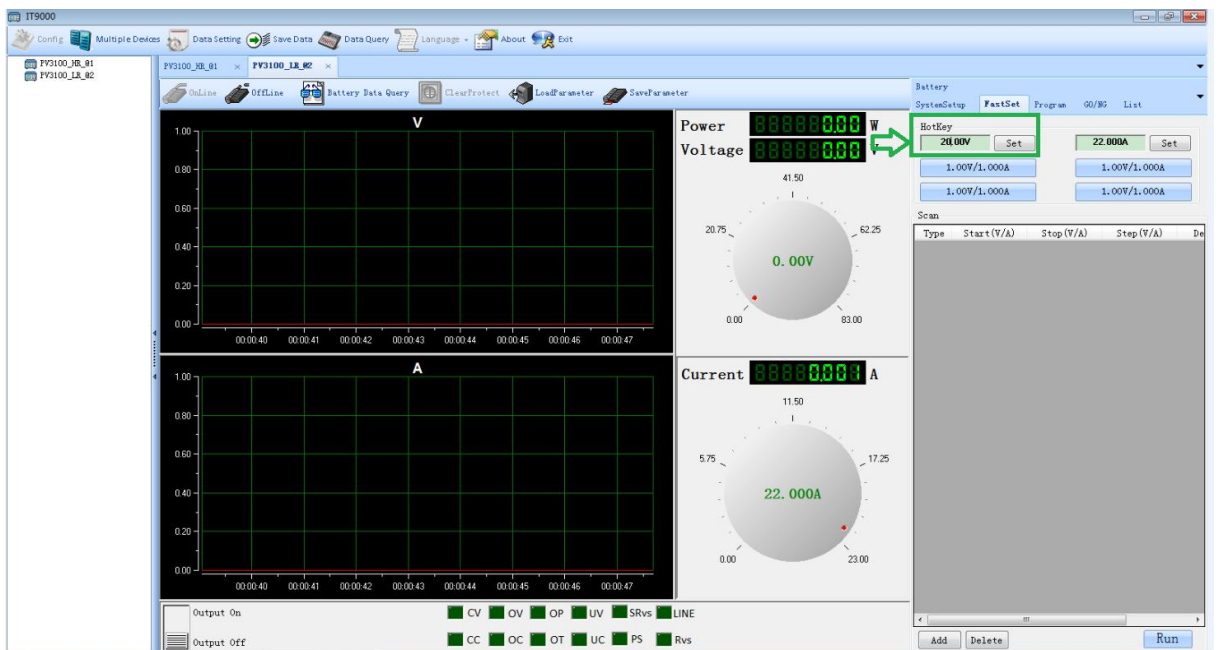
12. Click Online



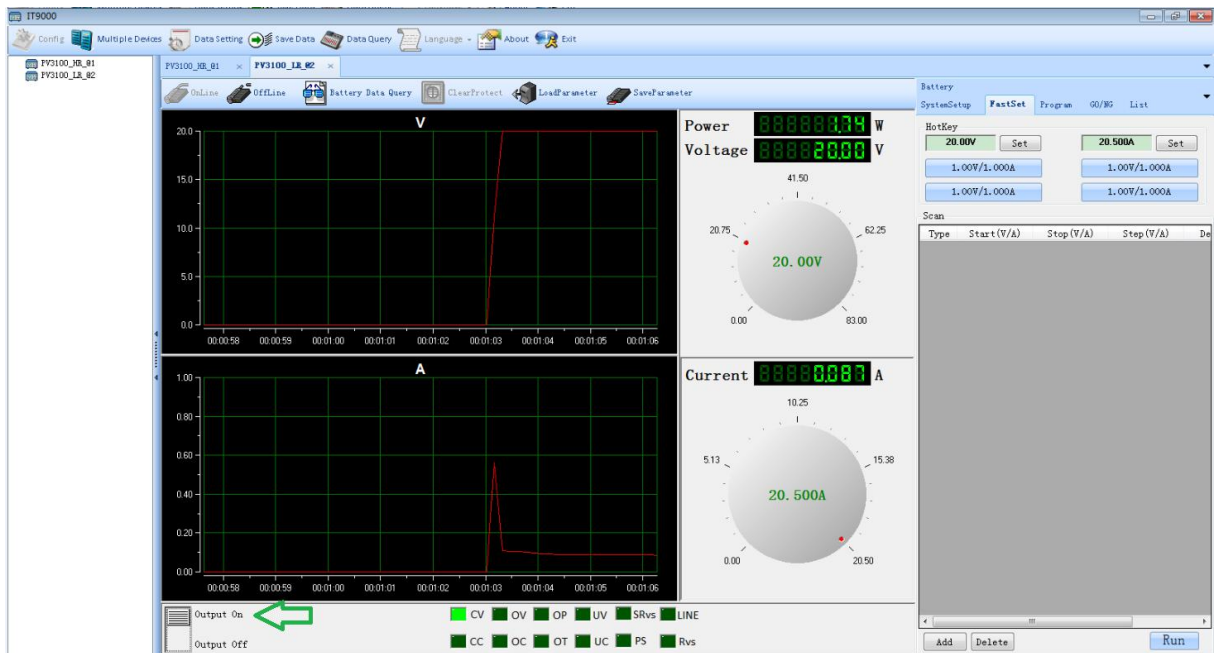
13. Click FastSet.



14. Set HotKey to 20V, and click Set.



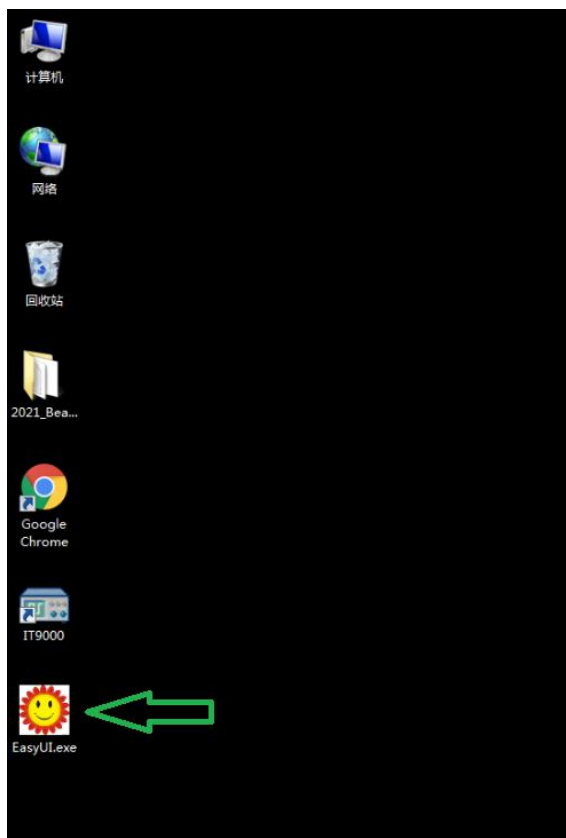
15. Click Output On. The power of ISCMOS2 is ok, when the red line in V- graph rush to 20V



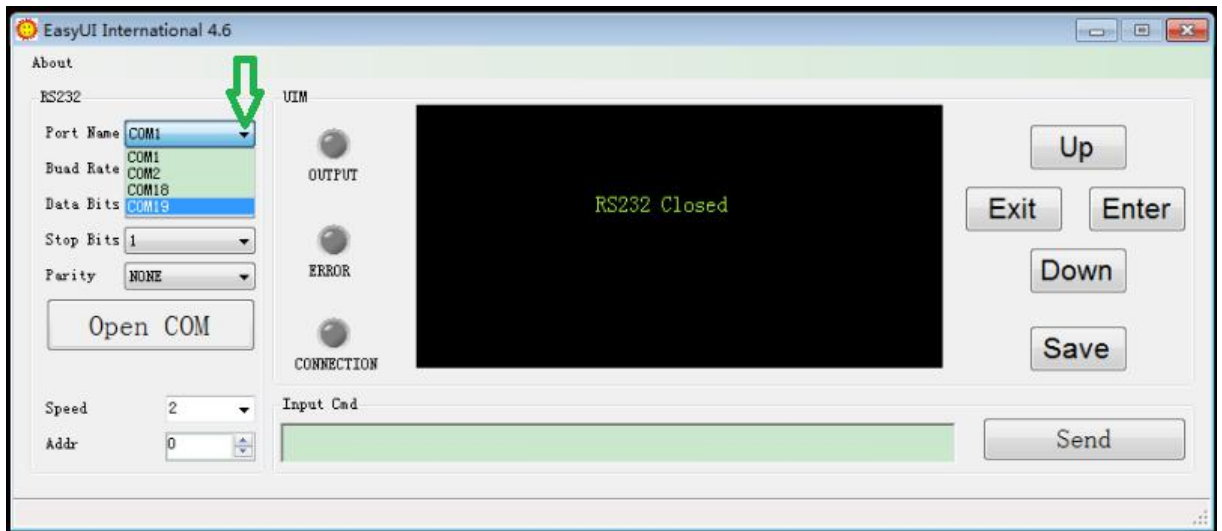
Part2. Temp Monitor

Parameters of temp have been fixed in the temp control devices. We could monitor it real time, also could change the parameters.

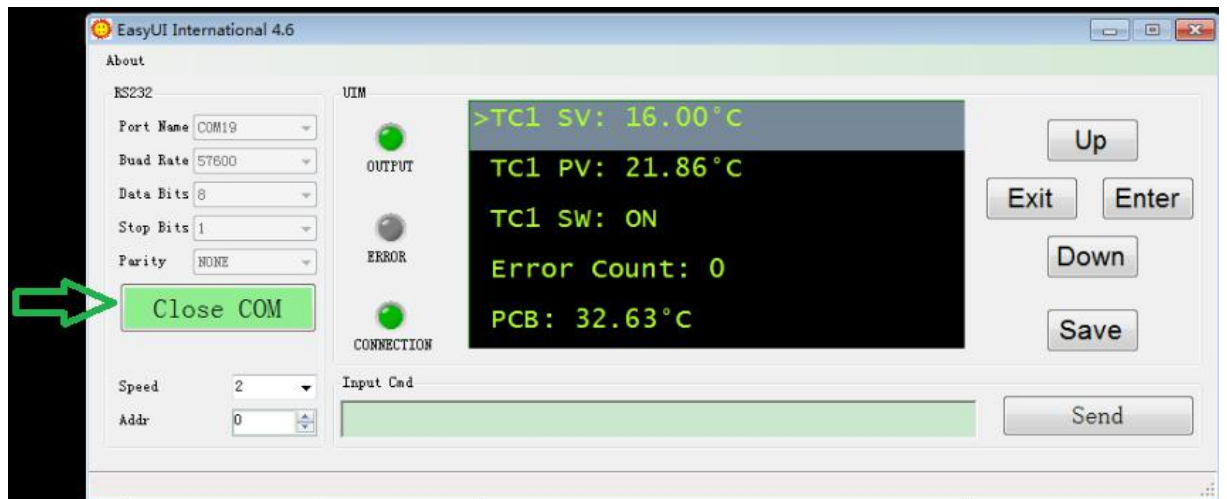
16. Run the progress EasyUI.exe on the desktop.



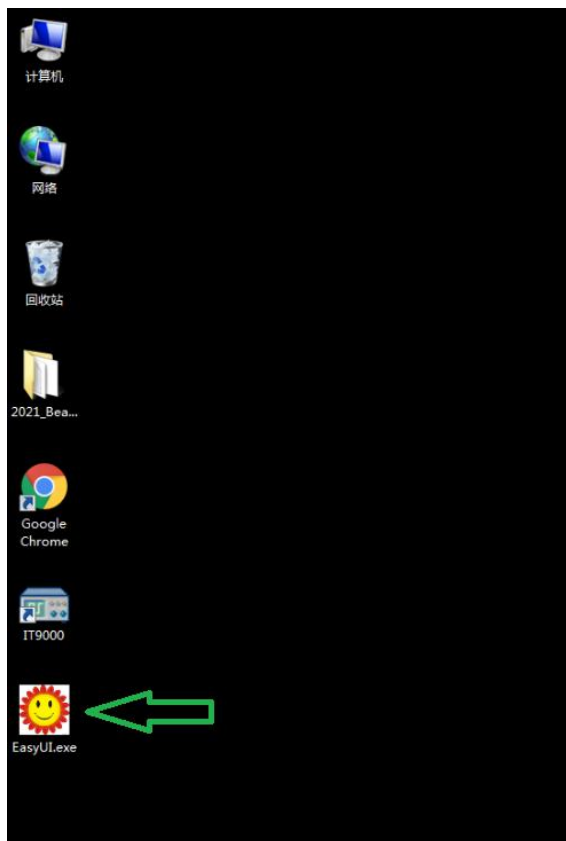
17. Choose COM19.



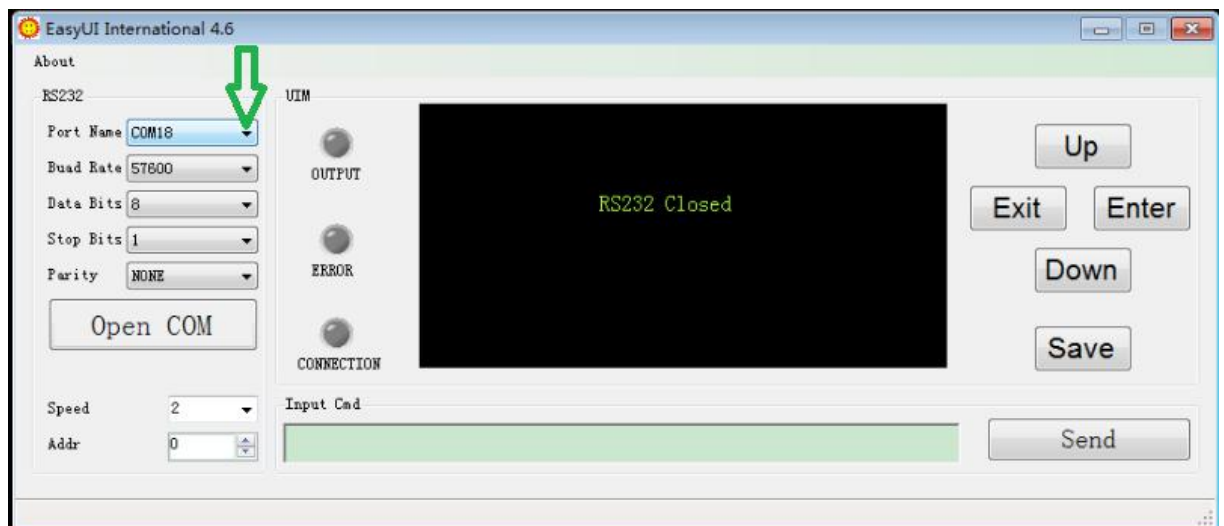
18. Click Open COM, and finish the monitor of TEM control 1#.



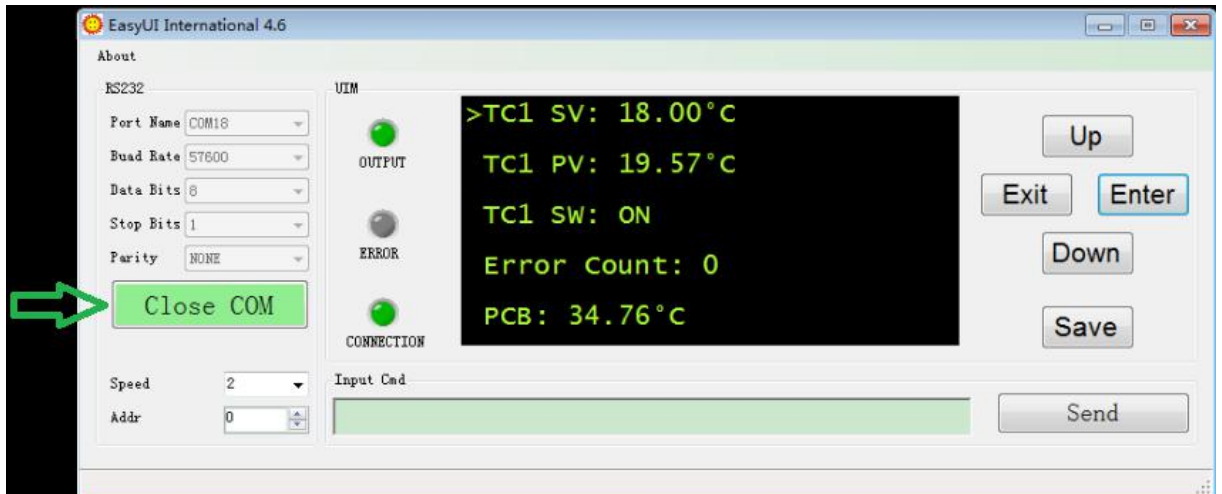
19. Run the progress EasyUI.exe on the desktop again.



20. Choose COM18.



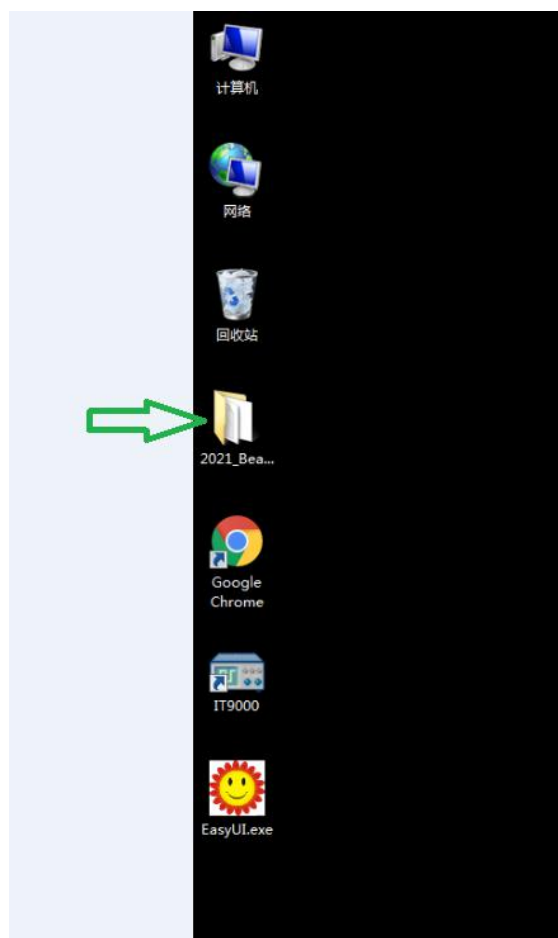
21. Click Open COM, and finish the monitor of TEM control 2#.



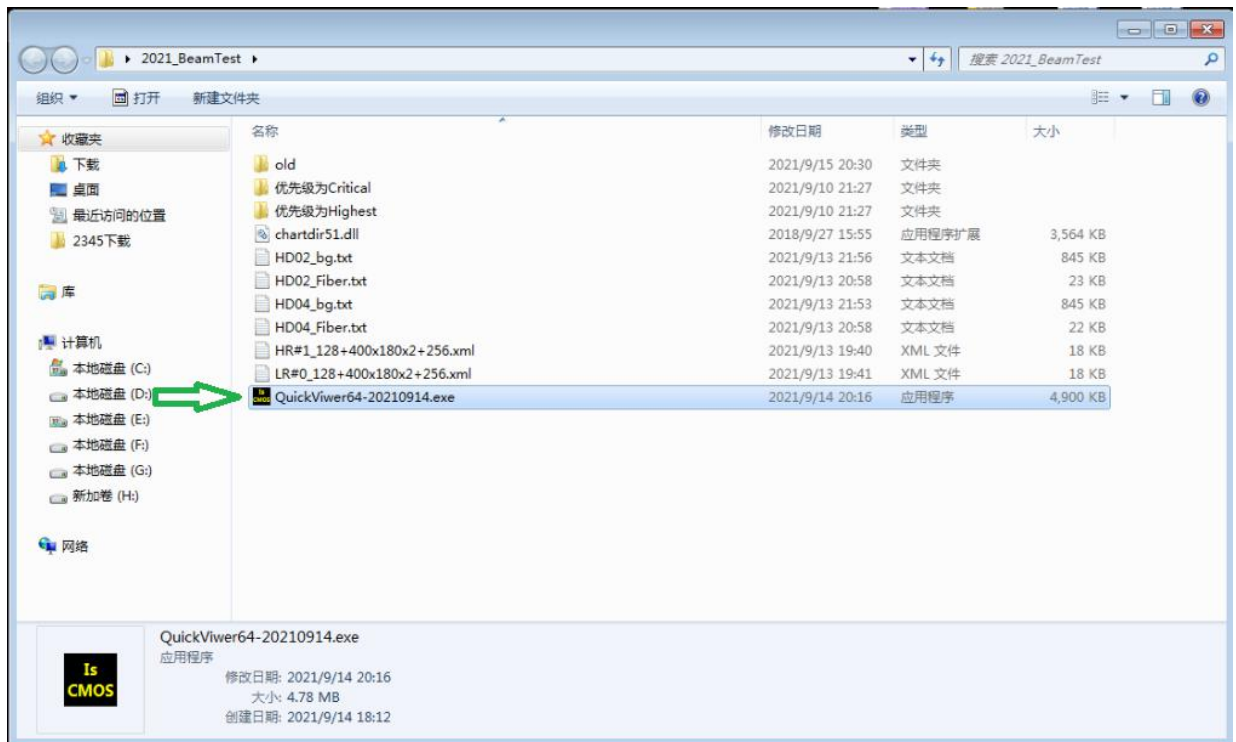
Part3. IMAQ software

The two ISCMOS IMAQ software can be found in windows desktop folder “2021_BeamTest”, named QuickViewer64_v0914.exe. The two IMAQs’ software are actually the same, but the xml profile and I.I gain value are different, so, it’s easy to use. Main windows are as follows:

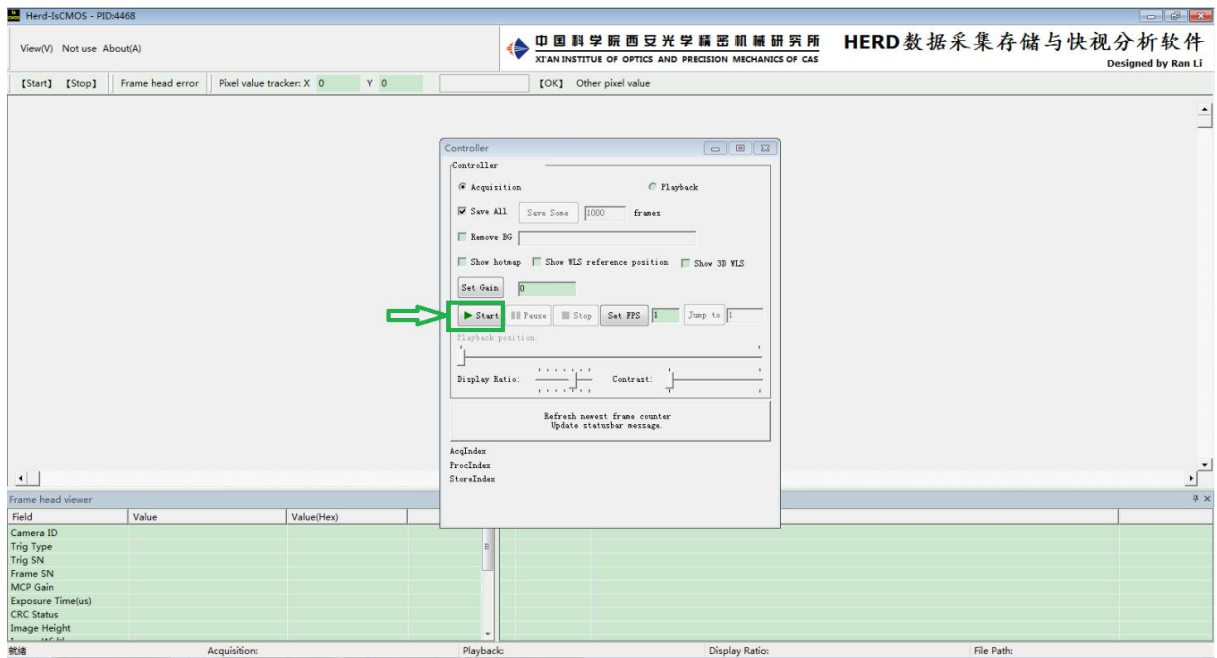
22. Choose 2021_BeamTest on the desktop.



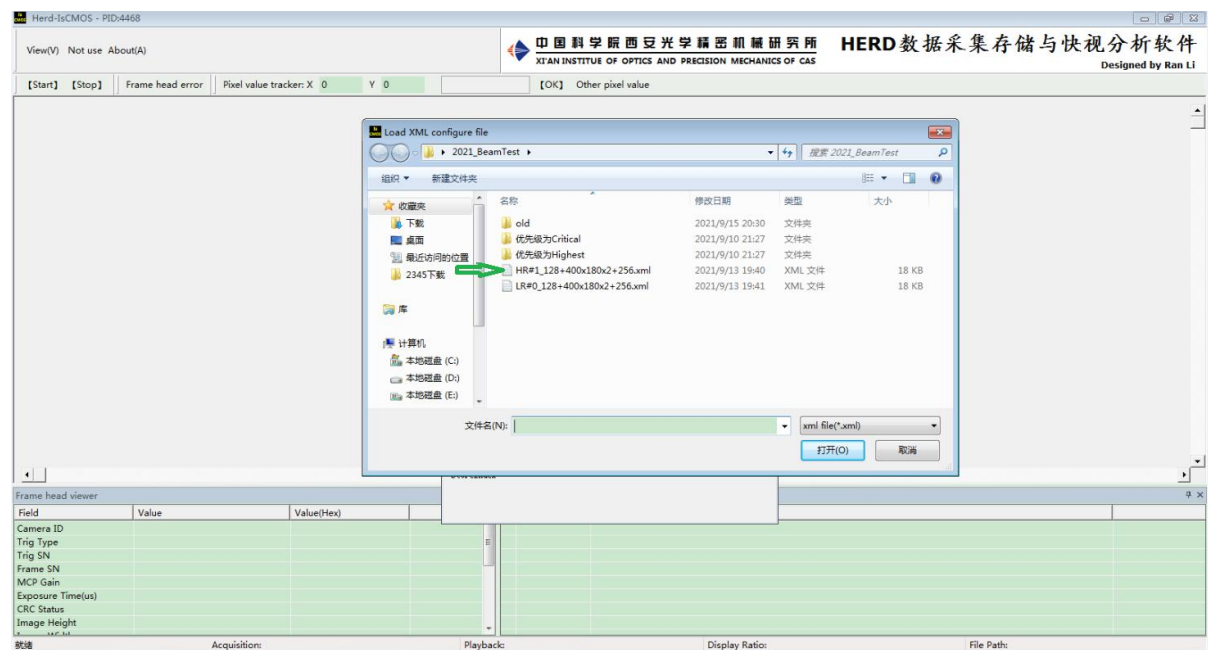
23. Run QuickViwer64_20210914.exe.



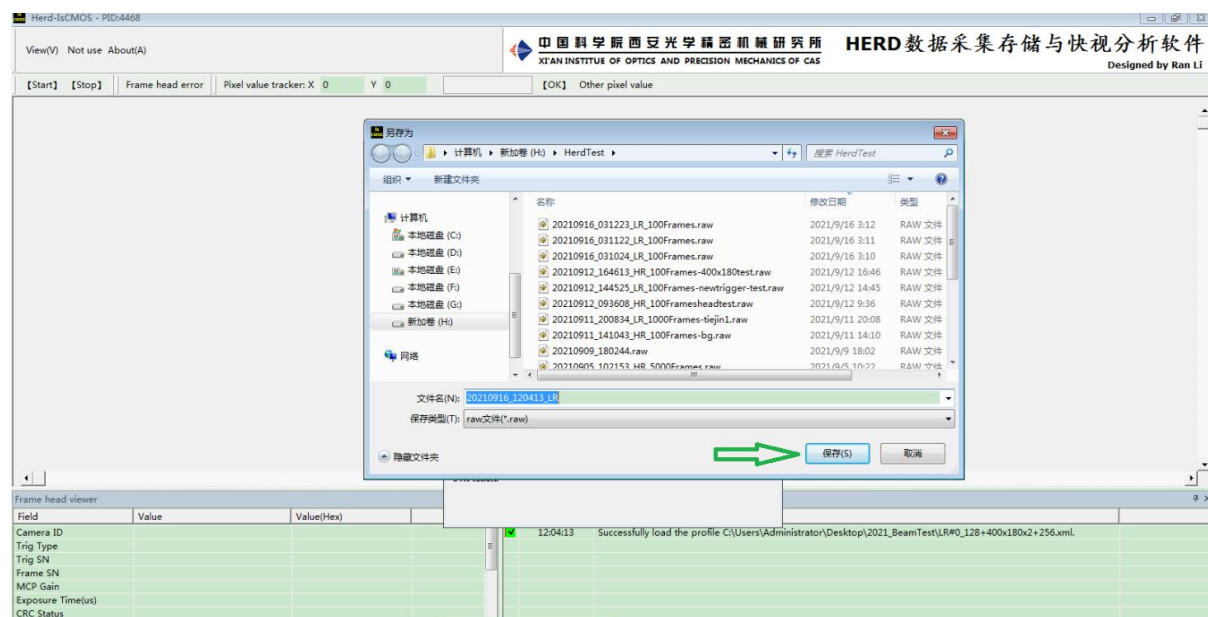
24. Click Start.



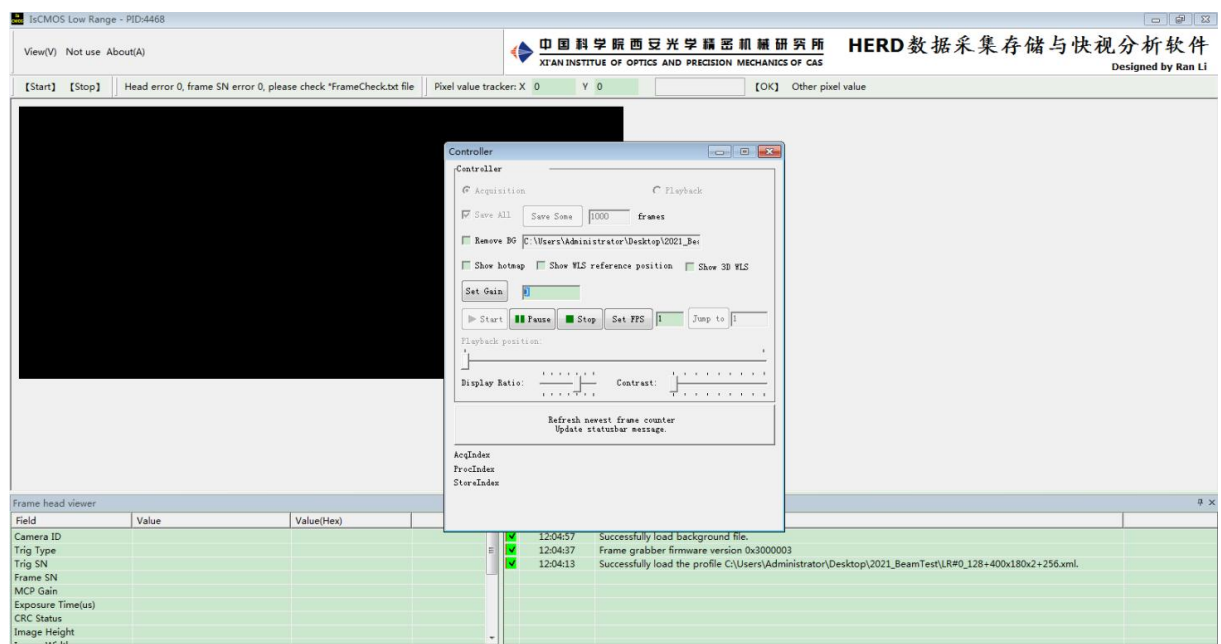
25. Choose HR#1_128+400x180x2+256.xml.



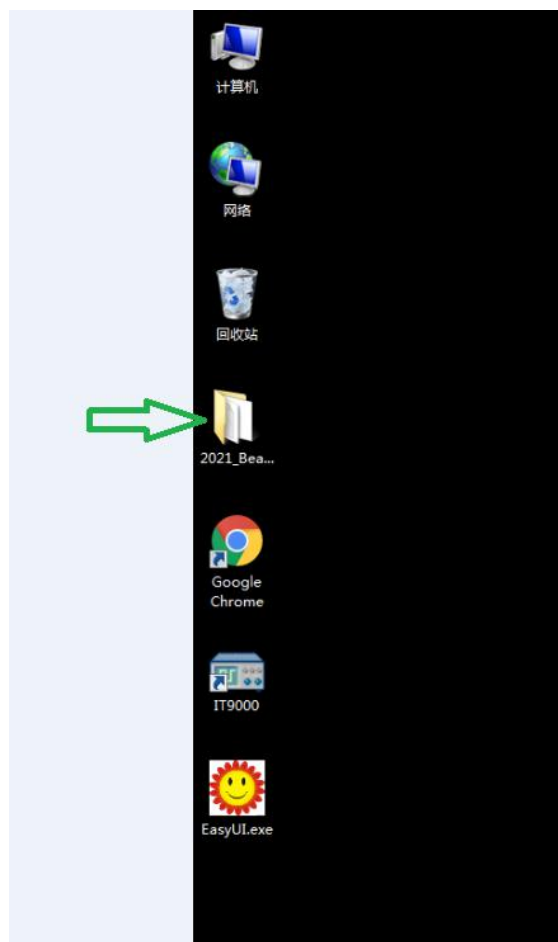
26. Click 保存, path and name of file default.



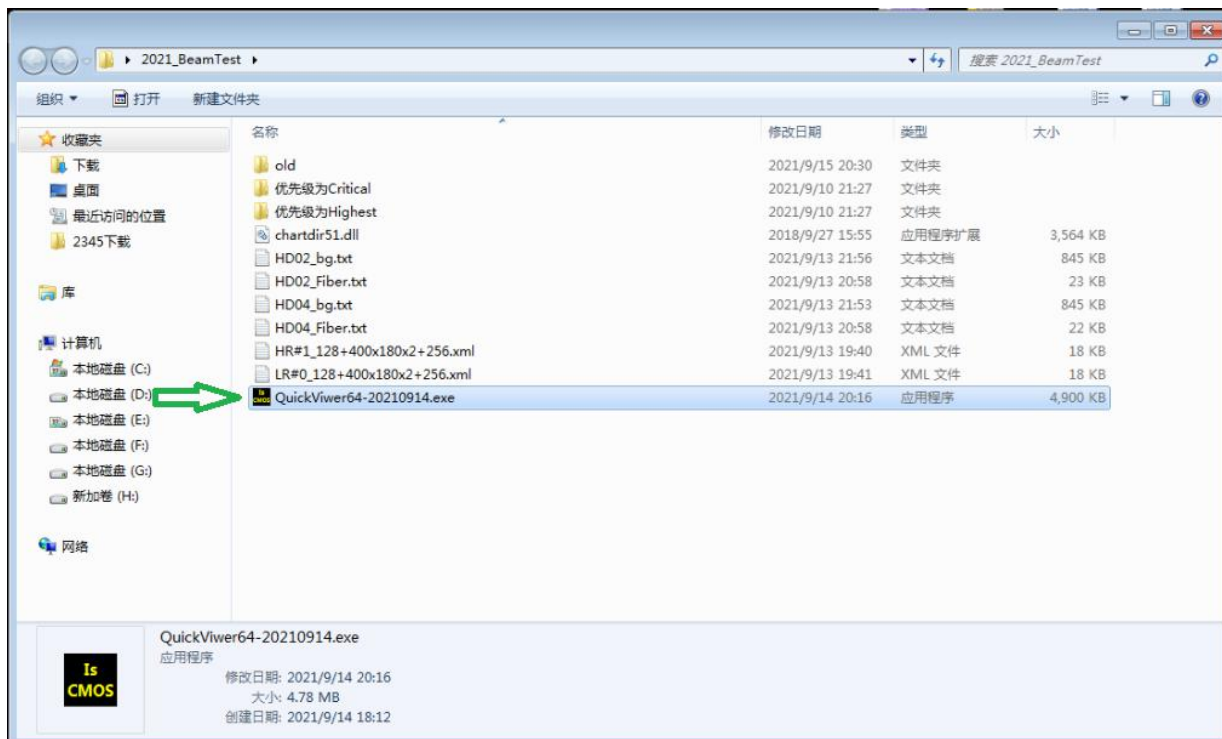
27. Finish the configuration of ISCOMS1.



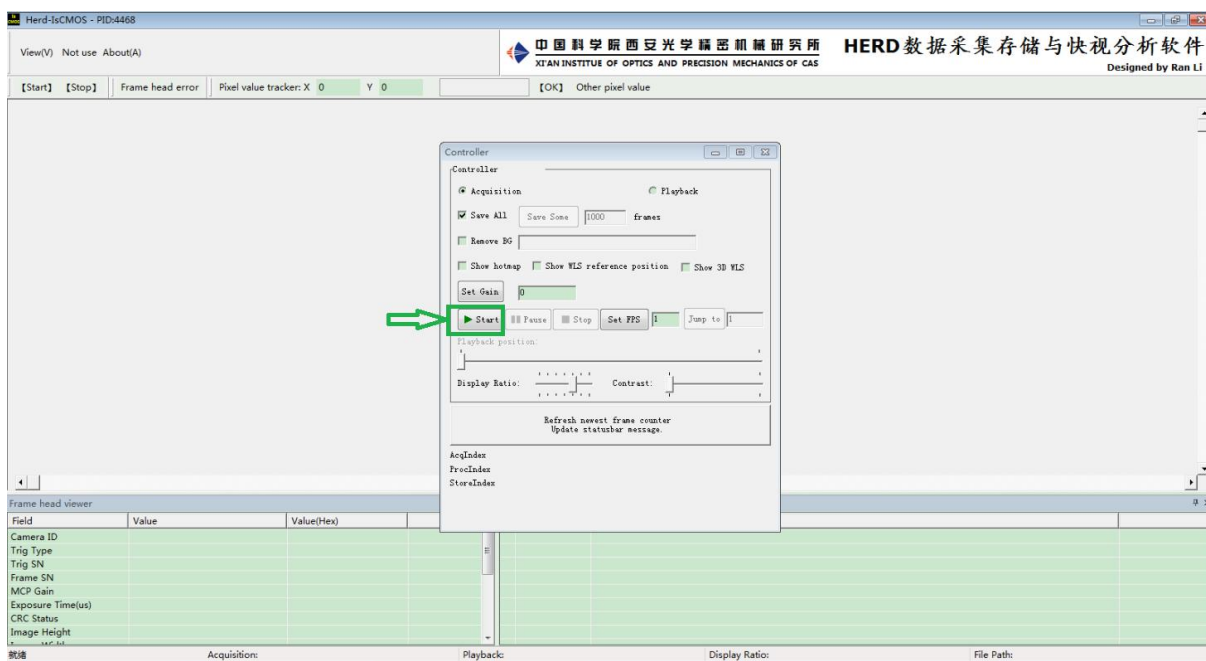
28. Choose 2021_BeamTest on the desktop again.



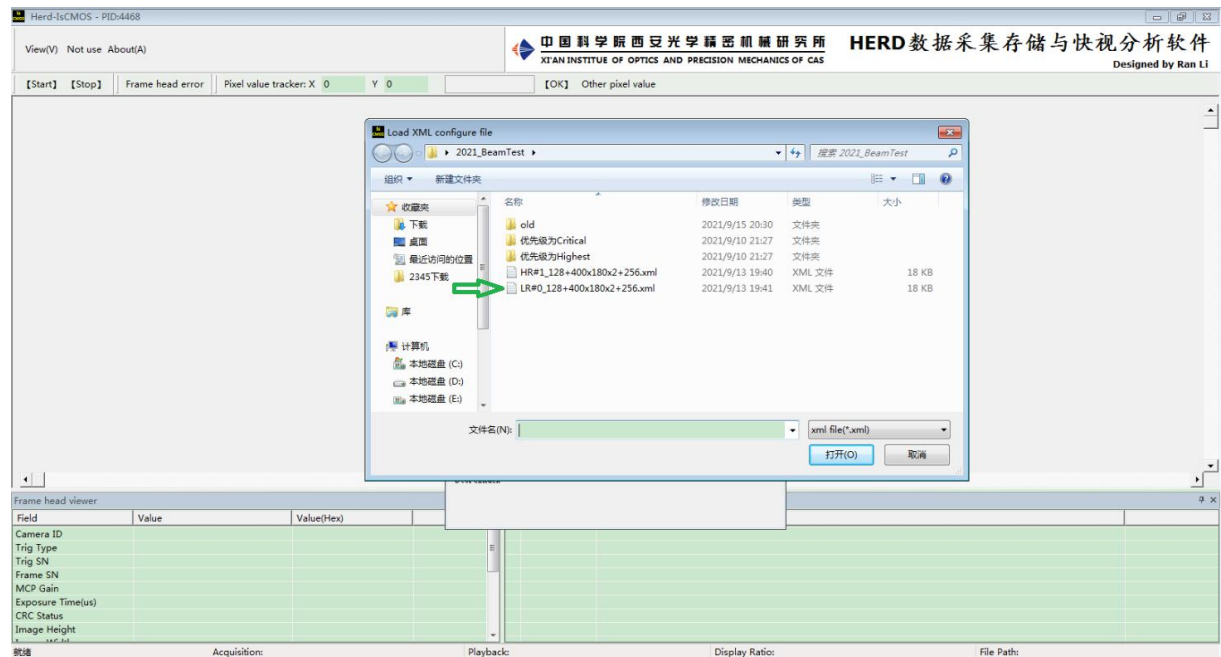
29. Run QuickViwer64_20210914.exe.



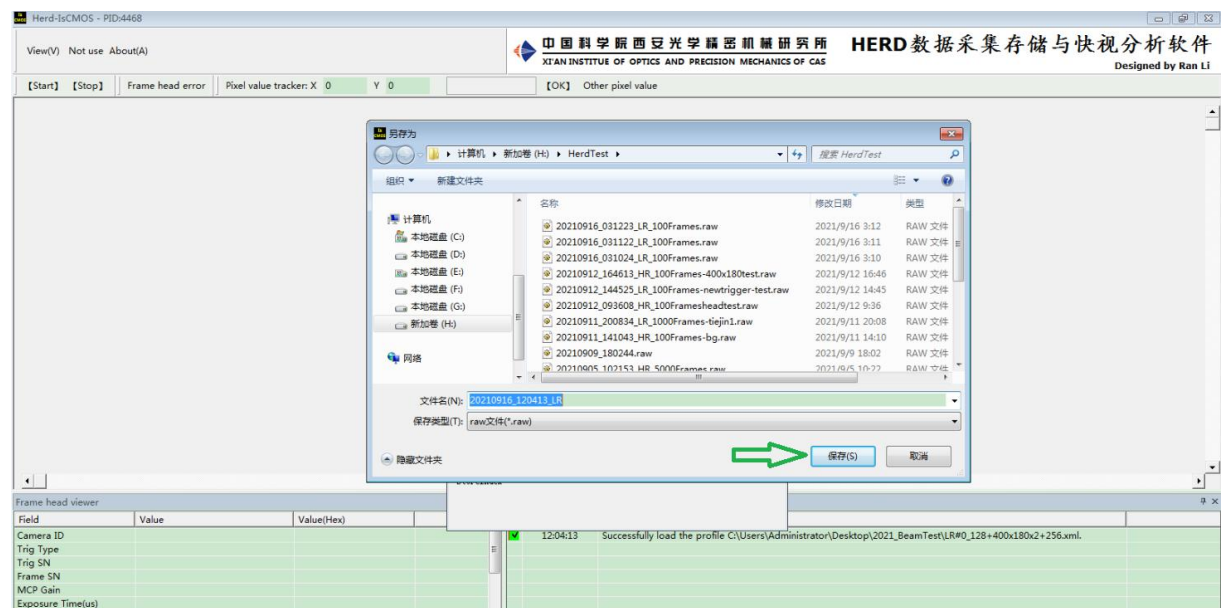
30. Click Start.



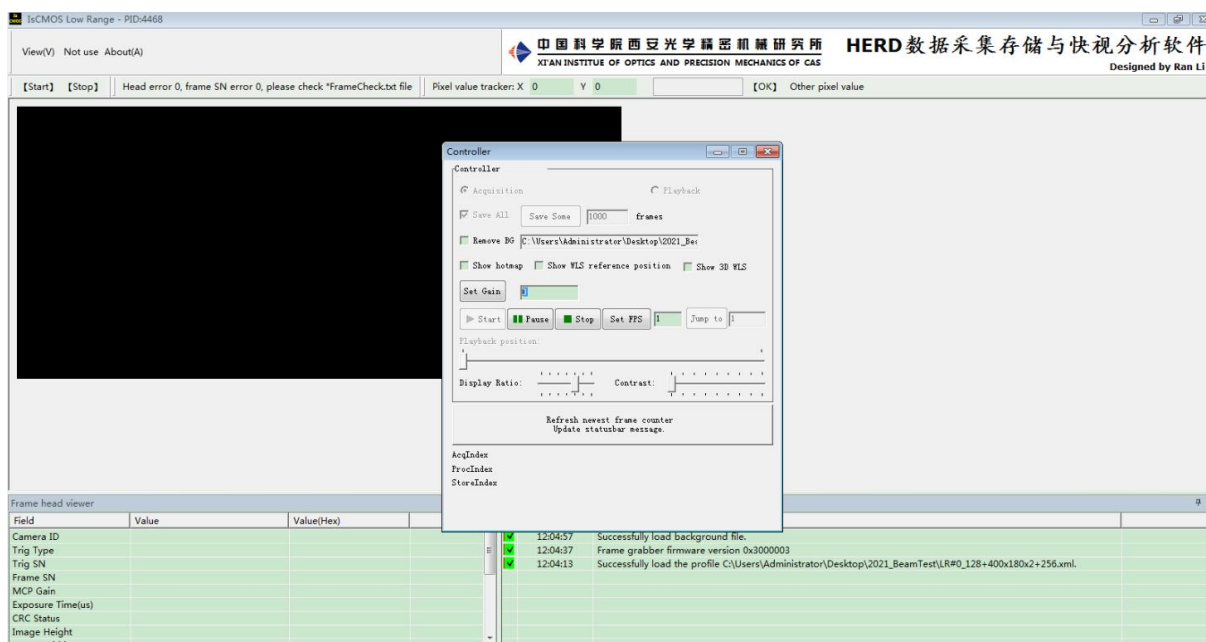
31. Choose LR#0_128+400x180x2+256.xml.



32. Click 保存, path and name of file default.

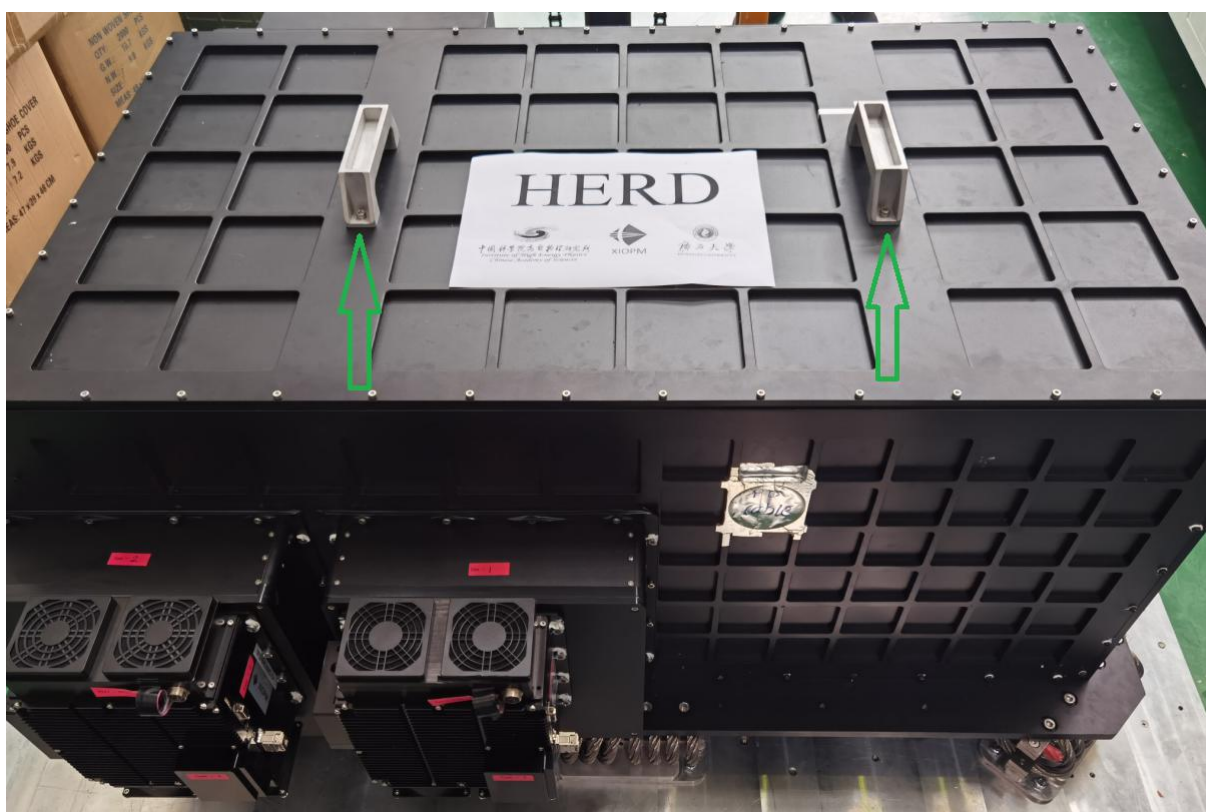


33. Finish the configuration of ISCOMS2.



Part4. ISCMOS Calibration.

34. Open the cover.



35. Trigger system send 100 signals, then ISCMOS collects and checks the state.

3.2.2 Particle run

3.2.3 Calibration run

3.2.4 Test outside the beam area after beam test

3.3 Abnormal operations

Operations in case of errors.

3.3.1.1 Sub title 4

4 Conclusion