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)

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1 Introduction

1.1 Introduction of the ISCMOS sub-system

Figure 1-1 Illustration of ISCMOS sub-system

Table 1-1 Device list of IS	SCMOS 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	To Cam-7 LAN							
cable	10 000 0 2000							
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

- 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.



 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.



 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.

 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.



 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.
- 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





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.

ut 🔲		
232 💔 VIM 🗧		
ort Name COM1		
aad Rate COM2 OUTPUT		op
ata Bits COM19	RS232 Closed	Exit Enter
top Bits 1 👻 🍘		
arity NONE - ERROR		Down
0		
Open COM		Save
CONNECTION		
peed 2 - Input Cmd		
aar lo 📥		Send

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

tout					
RS232			UIM		
Port Name	COM19			>TC1 SV: 16.00°C	Lin
Buad Rate	57600	¥	OUTPUT	TC1 PV: 21.86°C	Op
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Stop Bits	1		0	TC1 SW: ON	
Parity	NONE	¥	ERROR	Error Count: 0	Down
Clo	se COM	M	۲	PCB: 32.63°C	Save
			CONNECTION		
Speed	2	•	Input Cmd		
Addr	0	4			Send

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



20. Choose COM18.

	Lin
	Op
RS232 Closed	Exit Enter
	Down
	Save
	Send
	RS232 Closed

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

About					
RS232			UIM		
Port Name	COM18			>TC1 SV: 18.00°C	Lin
Buad Rate	57600	*	OUTPUT	TC1 PV: 19.57°C	Op
Data Bits	8	w.			Exit En
Stop Bits	1	+	۲	TC1 SW: ON	
Parity	NONE	Ŧ	ERROR	Error Count: 0	Down
> Cla	ose CON	1		PCB: 34.76°C	[Sava]
			CONNECTION		Save
Speed	2	•	Input Cmd		
åddr	0				Send

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.



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23. Run QuickViwer64_20210914.exe.

24. Click Start.

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

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

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27. Finish the configuration of ISCOMS1.

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28. Choose 2021_BeamTest on the desktop again.



29. Run QuickViwer64_20210914.exe.

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30. Click Start.

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

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33. Finish the configuration of ISCOMS2.

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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