

Instruction Manual

SUNJE  
Electrostatics

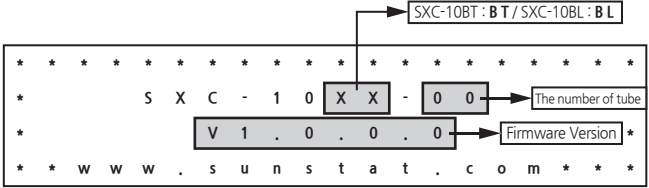
X

SXC-10BT/BL

Eng

1 SXC-10BT/BL operations

► When it powers on  
After dispalys for 2 seconds, it switch to the main screen.



► The main screen

Normal condition

< Page 1 >

1 . h h h h h	2 . h h h h h h
3 . h h h h h h	4 . h h h h h h
5 . h h h h h h	6 . h h h h h h
7 . h h h h h h	8 . h h h h h h



< Page 2 >

9 . h h h h h h
-----------------

- It indicates total used hours of tube.
- It shows "-----" on display when the tube doesn't connected.
- When the 9 tubes connected, push select button to go to < Page2 > .  
(Under 8 tubes, it doesn't go to < Page 2 > .)

When the alarm occurred

ex) When the H/V alarm occurred in no.3 and no.5 tube

< Page 1 >

1 . h h h h h h	2 . h h h h h h
3 . A L - 0 4	4 . h h h h h h
5 . A L - 0 4	6 . h h h h h h
7 . h h h h h h	8 . h h h h h h



< Page 2 >

9 . h h h h h h
-----------------

- It shows alarm information and tube number that alarm occurred.
  - It shows alarm information and usage time of the tube that alarm occurred every 5 seconds alternately.
  - Alarm information meaning
- |          | AL-04 (H/V abnormal)                         | AL-02 (Internal system error)   |
|----------|--|---------------------------------|
| SXC-10BT | Always display                               | Always display                  |
| SXC-10BL | Display while Bar Soft X-Ray lonizer working | Display in case of Interlock On |

► Menu

Press the enter button to switch to the menu screen.

1 . T o t a l T i m e	:	[ O ]
2 . T u b e I n f o	:	[ ]
3 . T u b e R e s e t	:	[ ]
4 . C t r l S e t	:	[ ]

1. Selecting Menu
  - You can select a menu sequentially via pushing the select button.
2. Run the Menu
  - You can run the menu via pushing the enter button.

1. Total Time

Indicating each tube's usage time

1 . h h h h h h	2 . h h h h h h
3 . h h h h h h	4 . h h h h h h
5 . h h h h h h	6 . h h h h h h
7 . h h h h h h	8 . h h h h h h

- It shows each tube's usage time and alarm information.  
※ Refer to operational method on page 01 \* ► Main screen "

2. Tube Info (Tube Information)

Indicating each tube's information : It is possible to check each tube's condition. (Usage time, Alarm, Overtime)

* T u b e 1 *	
T i m e	: h h h h h
A l a r m	: O f f
O v e r T i m e	: O f f

1. \*Tube1\*
  - You can change a tube number sequentially via pushing the select button.
2. Time condition
  - It indicates tube's usage time.
3. Alarm condition
  - 1) AL-04 : H/V abnormal      2) AL-02 : Internal system error
4. Overtime condition
  - 1) On : It means that replacement cycle is come.
  - 2) Off : It means that the tube is still available.

3. Tube Reset

Checking the tube reset information.

1) Normal conditions

T u b e	1 . h h h h h h	2 . h h h h h h
0 1	3 . h h h h h h	4 . h h h h h h
	5 . - - - - -	6 . - - - - -
	7 . - - - - -	8 . - - - - -

- You can run the tube reset in interlock off condition.
- It shows each tube's reset information. (Usage time before reset/ Up to 8ea)
- It indicates informations as the number of tube's reset.  
ex) If you run tube reset 3 times, then you can see the information from no.1 to no.3.  
No.4 shows current tube's usage time. From no.5, it shows "-----".
- If you run tube reset over 8 times, then 9th information will be indicated in no.8.
- You can check each tube's reset information via pushing the select button sequentially.

2) When the Alarm or Overtime occurred

T u b e	1 . h h h h h h	2 . h h h h h h
0 1	3 . h h h h h h	4 . A L - 0 4
	5 . - - - - -	6 . - - - - -
R e s e t	7 . - - - - -	8 . - - - - -

- The tube that has alarm occurred or overtime used shows status information instead of the current time.  
※ AL-04 : H/V abnormal / Over : Overtime (It doesn't indicates internal error.)
- It is possible to reset in the tube that has alarm, overtime problems.  
※ Reset sign on the displi in the lower left will blink.

3) How to Tube Reset

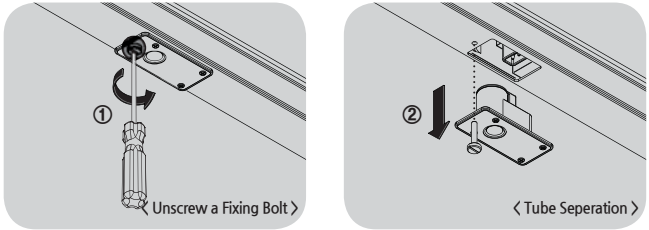
- CAUTION

  - \* When tube operates, heat is generated, Product is hot right after operation, so be careful not to touch it. There is a risk of burn.
  - \* A H/V connector of tube is protruded. After unscrew the bolts, pull the unit vertically. Please be careful when replacing H/V connector.
  - \* After replacement, check if tube and Bar Soft X-Ray lonizer body are connected correctly. Unless they are connected properly, ground could be unstable.
  - \* Do not unscrew any bolts other than fixing bolts.  
If unscrewed, it can occur fire, electric shock, and breakages.

- ① Tube separation
  - Turn off the power switch at the rear of the controller, and separate the tube

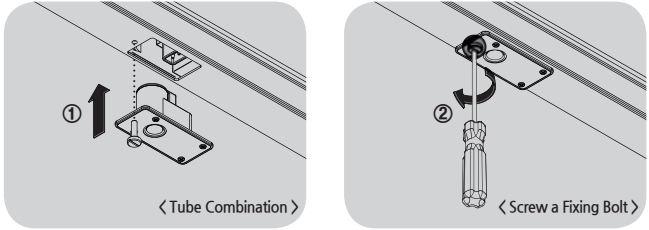
- WARNING

  - \* This device uses the high level of voltage. When the replacement of tube needed, turn off the power first, and separate the Tube.  
Otherwise, there might be in case of electric shock or fire damage.



- Unscrew Tube fixing bolt by turning in a counter-clockwise using hands or screw driver. (Don't separate a tube fixing bolt from a tube.)
- Pull a tube vertically against the Bar Soft X-Ray lonizer, once you unscrewed fixing bolts.
- Please discard tube autonomously or contact us to disuse.

② Tube combination



- Push a new replacing tube vertically firmly until it connects high-voltage connector properly.
- When a new tube is combined, screw the tube fixing bolt by turning in a clockwise direction to fix using hands or screw driver.
- When the tube replacement is complete, turn on the power switch at the rear of the controller.



③ Checking the tube reset information

T u b e	1 . h h h h h h	2 . h h h h h h
0 1	3 . h h h h h h	4 . A L - 0 4
	5 . - - - - -	6 . - - - - -
R e s e t	7 . - - - - -	8 . - - - - -

- It is possible to reset in the tube that has alarm, overtime problems.
- Select the tube that need reset in Interlock off condition.



④ For tube reset execution

T u b e	1 . h h h h h h	2 . h h h h h h
0 1	3 . h h h h h h	4 . P r o c
	5 . - - - - -	6 . - - - - -
R e s e t	7 . - - - - -	8 . - - - - -

- Execute the tube reset pushing Run/Stop button for more than 5 seconds.
- After execute tube reset, wait about 5 seconds.



⑤ - 1 When tube reset succeed

T u b e	1 . h h h h h h	2 . h h h h h h
0 1	3 . h h h h h h	4 . R e s e t
	5 . - - - - -	6 . - - - - -
R e s e t	7 . - - - - -	8 . - - - - -

- When tube reset succeed, controller will be stop.
- Controller will be operated normally after turn off and turn on the switch at the rear of the controller sequentially.



⑤ - 2 When tube reset failed

T u b e	1 . h h h h h h	2 . h h h h h h
0 1	3 . h h h h h h	4 . E r r o r
	5 . - - - - -	6 . - - - - -
R e s e t	7 . - - - - -	8 . - - - - -

- When tube reset failed, controller will be stop.
- Turn off and turn on the switch at the rear of the controller sequentially, and try again after checking the tube reset method.

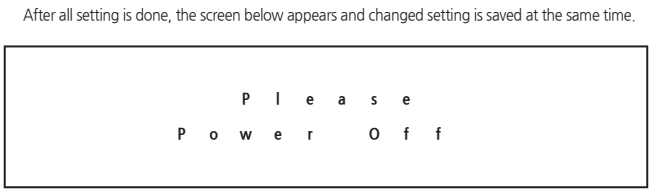
4. Ctrl Set (Controller Setting)

RMS(Real Monitoring System) for communication Address Setting and setting of the number of connected tube.

A	d	d	r	e	s	s	:	-	-						
T	u	b	e		N	u	m	b	e	r	:	-	-		
I	/	F			O	v	e	r	t	i	m	e	:	-	-
I	/	F			A	l	a	r	m		:	-	-		

1. Set the address value
- You can change address value sequentially via pushing the Select button. (1~16)
2. Set the number of tube
- Press Select button and you can change the number of tube in order. (1~9)
3. Overtime I/F setting (SXC-10BT Only)
- Press Select button and it can be changed.
- 1) ON : Use as Overtime Interface      2) OFF : Use as Alarm Interface
4. Alarm I/F setting (SXC-10BT Only)
- 1) ON : Interface alarm indicates when Bar Soft X-Ray Ionizer stops.
- 2) OFF : Interface alarm does not indicate when Bar Soft X-Ray Ionizer stops.

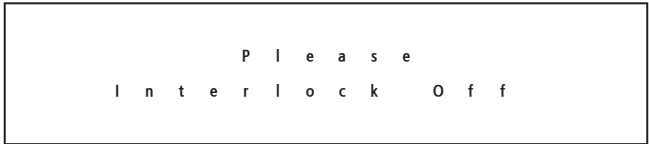
- ※ You can run the controller setting in Interlock off condition.
- ※ When you press Enter button after setting, next setting change is possible.
- ※ It blinks at interval on a second while you are setting on.



- It operates with changed setting figure when you turn the switch on again.
- If there is no change on setting, it does not show Power off, but moves to menu screen.

► Interlock Off

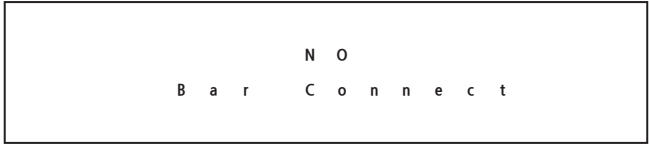
Tube rese, Controller setting can be run in Interlock off condition. If you try to rua Tube reset, Controller setting in Interlock On condition, you can see the screen in the below on the display.



※ How to cancel : To switch to the menu screen, wait more than 5 seconds or pressing the enter button.

► Bar Connect

The screen in the below indicated, but that Bar Soft X-ray Ionizer(SXB-05/10 Seroes) is not connected when run the tube reset.



※ How to cancel : To switch to the menu screen, wait more than 5 seconds or pressing the enter button.

2 RS-485 Communication (SXC-10BT)

1. Pin

- Pin 24 : RS-485(-)
- Pin 25 : RS-485(+)

2. Communication Spec.

- Baud : 9600
- Parity Bit : None
- Data Bit : 8
- Stop Bit : 1

3 Communication Protocol (SXC-10BT)

kV	Communications identifier by Model									
	Product Type	Ionizer Model								
		1	2	3	4	5	6	7	8	9
5	E	A	B	C	D	E	F	G	H	I
10		a	b	c	d	e	f	g	h	i

※ Different communications identifier could be chosen by the number of connected tube / tube voltage value.

1. Data Request				Communication Equipment → SXC-10BT										
Byte	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Code	\$	P	M	,	R	E	Q	,	A	*	Checksum		CR	LF

Byte	Information	Byte	Comment	Remarks
0	Start Code	1		
1	Product Type	1	Photo Type Ionizer	E : SXC-10BT
2	Ionizer Model	1	5kV : A ~ I, 10kV : a ~ i	
1, 2	Broadcasting	2	ZB	Response in all products
4, 5, 6	Command	3	REQ : Request, RUN : Run, STP : Stop	Sort by the number of tube in Bar (max. up to 9)
8	Address	1	Photo : 1 ~ 16	1,2,3,4,5,6,7,8,9,A,B,C,D,E,F,G
9	End Code	1		
10, 11	Check Sum	2	Check Sum	
12, 13	Carriage Return, Line Feed	2		

1. Data Receive					Communication Equipment — SXC-10BT									
Byte	0	1	2	3	4	5	6	7	8	9	10	11	12	13
ASCII	\$	P	M	,	A	,	T/C	,	T/O	,	T/A	,	Tube	
Byte	14	15	16	17	18	19	20	21	22	23	24	25	26	27
ASCII	Run Time(1)			,	T/C	,	T/O	,	T/A	,	Tube Run Time(2)			
Byte	28	29	30	31	32	33	34	35	36	37	38	39	40	41
ASCII		,	T/C	,	T/O	,	T/A	,	Tube Run Time(3)					,
Byte	42	43	44	45	46	47	48	49	50	51	52	53	54	55
ASCII	T/C	,	T/O	,	T/A	,	Tube Run Time(4)					,	T/C	,
Byte	56	57	58	59	60	61	62	63	64	65	66	67	68	69
ASCII	T/O	,	T/A	,	Tube Run Time(5)					,	T/C	,	T/O	,
Byte	70	71	72	73	74	75	76	77	78	79	80	81	82	83
ASCII	T/A	,	Tube Run Time(6)					,	T/C	,	T/O	,	T/A	,
Byte	84	85	86	87	88	89	90	91	92	93	94	95	96	97
ASCII	Tube Run Time(7)					,	I/S	,	R/S	,	P/S	,	A/S	,
Byte	98	99	100	101	102	103								
ASCII	R/S	*	Checksum	CR	LF									

※ Standard : model with 7 tubes

Byte	Information	Byte	Comment	Remarks
0	Start Code	1		
1	Product Type	1	Photo Type Ionizer	E : SXC-10BT
2	Ionizer Model	1	5kV : A ~ I, 10kV : a ~ i	Sort by the number of tube in Bar (max. up to 9)
4	Address	1	Photo : 1 ~ 16	1,2,3,4,5,6,7,8,9,A,B,C,D,E,F,G
6	Tube1 Connect	1	1 : Normal	1 : Tube Con(Always)
8	Tube1 Over Time	1	0 : Normal, 1 : Abnormal	Abnormal when Over Time
10	Tube1 Alarm	1	0 : Normal, 1 : Tube Fail, 3 : Comm out	Abnormal except for 0
12 ~ 16	Tube1 Run Time	5	00000 ~ 99999 Hour	
18	Tube2 Connect	1	1 : Normal	1 : Tube Con(Always)
20	Tube2 Over Time	1	0 : Normal, 1 : Abnormal	Abnormal when Over Time
22	Tube2 Alarm	1	0 : Normal, 1 : Tube Fail, 3 : Comm out	Abnormal except for 0
24 ~ 28	Tube2 Run Time	5	00000 ~ 99999 Hour	
30	Tube3 Connect	1	1 : Normal	1 : Tube Con(Always)
32	Tube3 Over Time	1	0 : Normal, 1 : Abnormal	Abnormal when Over Time
34	Tube3 Alarm	1	0 : Normal, 1 : Tube Fail, 3 : Comm out	Abnormal except for 0
36 ~ 40	Tube3 Run Time	5	00000 ~ 99999 Hour	
42	Tube4 Connect	1	1 : Normal	1 : Tube Con(Always)
44	Tube4 Over Time	1	0 : Normal, 1 : Abnormal	Abnormal when Over Time
46	Tube4 Alarm	1	0 : Normal, 1 : Tube Fail, 3 : Comm out	Abnormal except for 0
48 ~ 52	Tube4 Run Time	5	00000 ~ 99999 Hour	
54	Tube5 Connect	1	1 : Normal	1 : Tube Con(Always)
56	Tube5 Over Time	1	0 : Normal, 1 : Abnormal	Abnormal when Over Time
58	Tube5 Alarm	1	0 : Normal, 1 : Tube Fail, 3 : Comm out	Abnormal except for 0
60 ~ 64	Tube5 Run Time	5	00000 ~ 99999 Hour	
66	Tube6 Connect	1	1 : Normal	1 : Tube Con(Always)
68	Tube6 Over Time	1	0 : Normal, 1 : Abnormal	Abnormal when Over Time
70	Tube6 Alarm	1	0 : Normal, 1 : Tube Fail, 3 : Comm out	Abnormal except for 0
72 ~ 76	Tube6 Run Time	5	00000 ~ 99999 Hour	
78	Tube7 Connect	1	1 : Normal	1 : Tube Con(Always)
80	Tube7 Over Time	1	0 : Normal, 1 : Abnormal	Abnormal when Over Time
82	Tube7 Alarm	1	0 : Normal, 1 : Tube Fail, 3 : Comm out	Abnormal except for 0
84 ~ 88	Tube7 Run Time	5	00000 ~ 99999 Hour	
※ Depending on the number of connected tube, communications data byte number will be various.				
90	Controller Interlock State	1	0: Interlock Off, 1: Interlock On	
92	Controller Remote State	1	0: Remote Off, 1: Remote On	
94	Controller Power State	1	0: Power Off, 1: Power On	
96	Controller Alarm State	1	0 : Normal, 1 : Tube Fail, 3 : Comm out	Abnormal when one or more Tube Alarm happens
98	Controller Run/Stop State	1	1 : Run, 0 : Stop	
99	End Code	1		
100, 101	Check Sum	2	Checksum	
102, 103	Carriage Return, Line Feed	2		

※ Standard : model with 7 tubes

2. Control [Run]		Communication Equipment → SXC-10BT												
Byte	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Code	\$	P	M	,	R	U	N	,	A	*	Checksum	CR	LF	

2. No Receive		Communication Equipment ← SXC-10BT												
---------------	--	------------------------------------	--	--	--	--	--	--	--	--	--	--	--	--

3. Control [Stop]		Communication Equipment → SXC-10BT												
Byte	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Code	\$	P	M	,	S	T	P	,	A	*	Checksum	CR	LF	

3. No Receive		Communication Equipment ← SXC-10BT												
---------------	--	------------------------------------	--	--	--	--	--	--	--	--	--	--	--	--

```
Checksum Calculation
$ ~ * Calculation

#include<stdio.h>

void main()
{
    char packet[] = "EG,REQ,1", cksum = 0;
    int i, size = 0;

    while(packet[size] != '\0') size++;

    for(i = 0 ; i < size ; i++)
    {
        if(i == 0)
            cksum = packet[i];
        else
            cksum ^= packet[i];
    }
    printf("Request : $EG,REQ,1*% .2X",cksum); //Checksum character send by ASCII.
}
```

※ Checksum inspection is the result of all data from \$ to \* as Exclusive-Or calculating.

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