

Instruction Manual

SUNJE
Electrostatics

SXC-154NH Communication

1 RS-485 Communication

1. Pin

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

2. Communication Spec.

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

2 Communication Protocol

kV	Model 별 통신 식별자				
	Product Type	Ionizer Model			
		1	2	3	4
15	E	q	r	s	t

※ 연결된 Head 개수/관전압 수치에 따라 통신 식별자가 다름

1. Data Request				통신장비 → SXC-154NH										
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, SXC-154NH
2	Ionizer Model	1	5kV : q ~ t	Head 개수에 따라 구분 (최대 4개까지 연결)
1, 2	Broadcasting	2	ZB	제품군, 제품명 상관없이 응답
4, 5, 6	Command	3	REQ : Request / RUN : Run / STP : Stop / VER : Version	
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		

1.1 Data Receive					통신장비 ← SXC-154NH (컨트롤러 Type 설정 1)										
Byte	0	1	2	3	4	5	6	7	8	9	10	11	12	13	
ASCII	\$	P	M	,	A	,	H/C	,	H/O	,	H/A	,	Head		
Byte	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
ASCII	Run Time(1)			,	I/S	,	R/S	,	P/S	,	A/S	,	R/S	*	
Byte	28	29	30	31											
ASCII	Checksum		CR	LF											

Byte	Information	Byte	Comment	Remarks
0	Start Code	1		
1	Product Type	1	Photo Type Ionizer	E : SXC-10BT, SXC-154NH
2	Ionizer Model	1	15kV : q ~ t	Head 개수에 따라 구분 (최대 4개까지 연결)
4	Address	1	Photo : 1 ~ 16	1,2,3,4,5,6,7,8,9,A,B,C,D,E,F,G
6	Head1 Connect	1	1 : Normal, 0 : Abnormal	0 : Head Not Con 1 : Head Con (초기 연결 판단)
8	Head1 Over Time	1	0 : Normal, 1 : Abnormal	Over Time 시 Abnormal
10	Head1 Alarm	1	0 : Normal, 1 : Head Fail, 3 : Comm out, 4 : Head Connect Alarm	0 이외 Abnormal
12 ~ 16	Head1 Run Time	5	00000 ~ 99999 Hour	
18	Controller Interlock State	1	0 : Interlock Off, 1 : Interlock On	
20	Controller Remote State	1	0 : Remote Off, 1 : Remote On	
22	Controller Power State	1	0 : Power Off, 1 : Power On	
24	Controller Alarm State	1	0 : Normal, 1 : Head Fail, 3 : Comm out, 4 : Head Connect Alarm	Head Alarm 1개 이상 발생 시 Abnormal
26	Controller Run/Stop State	1	0 : Stop, 1 : Run	
27	End Code	1		
28, 29	Check Sum	2	Check Sum	
30, 31	Carriage Return, Line Feed	2		

1.1 Data Receive					통신장비 ← SXC-154NH (컨트롤러 Type 설정 2)									
Byte	0	1	2	3	4	5	6	7	8	9	10	11	12	13
ASCII	\$	P	M	,	A	,	H/C	,	H/O	,	H/A	,	Head	
Byte	14	15	16	17	18	19	20	21	22	23	24	25	26	27
ASCII	Run Time(1)			,	H/C	,	H/O	,	H/A	,	Head Run Time(2)			
Byte	28	29	30	31	32	33	34	35	36	37	38	39	40	41
ASCII		,	I/S	,	R/S	,	P/S	,	A/S	,	R/S	*	Checksum	
Byte	42	43												
ASCII	CR	LF												

Byte	Information	Byte	Comment	Remarks
0	Start Code	1		
1	Product Type	1	Photo Type Ionizer	E : SXC-10BT, SXC-154NH
2	Ionizer Model	1	15kV : q ~ t	Head 개수에 따라 구분 (최대 4개까지 연결)
4	Address	1	Photo : 1 ~ 16	1,2,3,4,5,6,7,8,9,A,B,C,D,E,F,G
6	Head1 Connect	1	1 : Normal, 0 : Abnormal	0 : Head Not Con 1 : Head Con (초기 연결 판단)
8	Head1 Over Time	1	0 : Normal, 1 : Abnormal	Over Time 시 Abnormal
10	Head1 Alarm	1	0 : Normal, 1 : Head Fail, 3 : Comm out, 4 : Head Connect Alarm	0 이외 Abnormal
12 ~ 16	Head1 Run Time	5	00000 ~ 99999 Hour	
18	Head2 Connect	1	1 : Normal, 0 : Abnormal	0 : Head Not Con 1 : Head Con (초기 연결 판단)
20	Head2 Over Time	1	0 : Normal, 1 : Abnormal	Over Time 시 Abnormal
22	Head2 Alarm	1	0 : Normal, 1 : Head Fail, 3 : Comm out, 4 : Head Connect Alarm	0 이외 Abnormal
24 ~ 28	Head2 Run Time	5	00000 ~ 99999 Hour	

30	Controller Interface State	1	0 : Interlock Off, 1 : Interlock On	
32	Controller Remote State	1	0 : Remote Off, 1 : Remote On	
34	Controller Power State	1	0 : Power Off, 1 : Power On	
36	Controller Alarm State	1	0 : Normal, 1 : Head Fail, 3 : Comm out, 4 : Head Connect Alarm	Head Alarm 1개 이상 발생 시 Abnormal
38	Controller Run/Stop State	1	0 : Stop, 1 : Run	
39	End Code	1		
40, 41	Check Sum	2	Check Sum	
42, 43	Carriage Return, Line Feed	2		

1.1 Data Receive					통신장비 ← SXC-154NH (컨트롤러 Type 설정 3)									
Byte	0	1	2	3	4	5	6	7	8	9	10	11	12	13
ASCII	\$	P	M	,	A	,	H/C	,	H/O	,	H/A	,	Head	
Byte	14	15	16	17	18	19	20	21	22	23	24	25	26	27
ASCII	Run Time(1)			,	H/C	,	H/O	,	H/A	,	Head Run Time(2)			
Byte	28	29	30	31	32	33	34	35	36	37	38	39	40	41
ASCII		,	H/C	,	H/O	,	H/A	,	Head Run Time(3)					
Byte	42	43	44	45	46	47	48	49	50	51	52	53	54	55
ASCII	I/S	,	R/S	,	P/S	,	A/S	,	R/S	*	Checksum		CR	LF

Byte	Information	Byte	Comment	Remarks
0	Start Code	1		
1	Product Type	1	Photo Type Ionizer	E : SXC-10BT, SXC-154NH
2	Ionizer Model	1	15kV : q ~ t	Head 개수에 따라 구분 (최대 4개까지 연결)
4	Address	1	Photo : 1 ~ 16	1,2,3,4,5,6,7,8,9,A,B,C,D,E,F,G
6	Head1 Connect	1	1 : Normal, 0 : Abnormal	0 : Head Not Con 1 : Head Con (초기 연결 판단)
8	Head1 Over Time	1	0 : Normal, 1 : Abnormal	Over Time 시 Abnormal
10	Head1 Alarm	1	0 : Normal, 1 : Head Fail, 3 : Comm out, 4 : Head Connect Alarm	0 이외 Abnormal
12 ~ 16	Head1 Run Time	5	00000 ~ 99999 Hour	
18	Head2 Connect	1	1 : Normal, 0 : Abnormal	0 : Head Not Con 1 : Head Con (초기 연결 판단)
20	Head2 Over Time	1	0 : Normal, 1 : Abnormal	Over Time 시 Abnormal
22	Head2 Alarm	1	0 : Normal, 1 : Head Fail, 3 : Comm out, 4 : Head Connect Alarm	0 이외 Abnormal
24 ~ 28	Head2 Run Time	5	00000 ~ 99999 Hour	
30	Head3 Connect	1	1 : Normal, 0 : Abnormal	0 : Head Not Con 1 : Head Con (초기 연결 판단)
32	Head3 Over Time	1	0 : Normal, 1 : Abnormal	Over Time 시 Abnormal
34	Head3 Alarm	1	0 : Normal, 1 : Head Fail, 3 : Comm out, 4 : Head Connect Alarm	0 이외 Abnormal
36 ~ 40	Head3 Run Time	5	00000 ~ 99999 Hour	
42	Controller Interface State	1	0 : Interlock Off, 1 : Interlock On	
44	Controller Remote State	1	0 : Remote Off, 1 : Remote On	
46	Controller Power State	1	0 : Power Off, 1 : Power On	
48	Controller Alarm State	1	0 : Normal, 1 : Head Fail, 3 : Comm out, 4 : Head Connect Alarm	Head Alarm 1개 이상 발생 시 Abnormal
50	Controller Run/Stop State	1	0 : Stop, 1 : Run	

51	End Code	1		
52, 53	Check Sum	2	Check Sum	
54, 55	Carriage Return, Line Feed	2		

1,1 Data Receive				통신장비 ← SXC-154NH (컨트롤러 Type 설정 4)									
Byte	0	1	2	3	4	5	6	7	8	9	10	11	12
ASCII	\$	P	M	,	A	,	H/C	,	H/O	,	H/A	,	Head
Byte	14	15	16	17	18	19	20	21	22	23	24	25	26
ASCII	Run Time(1)				H/C	,	H/O	,	H/A	,	Head Run Time(2)		
Byte	28	29	30	31	32	33	34	35	36	37	38	39	40
ASCII			H/C	,	H/O	,	H/A	,	Head Run Time(3)				
Byte	42	43	44	45	46	47	48	49	50	51	52	53	54
ASCII	H/C	,	H/O	,	H/A	,	Head Run Time(4)					I/S	
Byte	56	57	58	59	60	61	62	63	64	65	66	67	
ASCII	R/S	,	P/S	,	A/S	,	R/S	*	Checksum	CR	LF		

Byte	Information	Byte	Comment	Remarks
0	Start Code	1		
1	Product Type	1	Photo Type Ionizer	E : SXC-10BT, SXC-154NH
2	Ionizer Model	1	15kV : q ~ t	Head 개수에 따라 구분 (최대 4개까지 연결)
4	Address	1	Photo : 1 ~ 16	1,2,3,4,5,6,7,8,9,A,B,C,D,E,F,G
6	Head1 Connect	1	1 : Normal, 0 : Abnormal	0 : Head Not Con 1 : Head Con (초기 연결 판단)
8	Head1 Over Time	1	0 : Normal, 1 : Abnormal	Over Time 시 Abnormal
10	Head1 Alarm	1	0 : Normal, 1 : Head Fail, 3 : Comm out, 4 : Head Connect Alarm	0 이외 Abnormal
12 ~ 16	Head1 Run Time	5	00000 ~ 99999 Hour	
18	Head2 Connect	1	1 : Normal, 0 : Abnormal	0 : Head Not Con 1 : Head Con (초기 연결 판단)
20	Head2 Over Time	1	0 : Normal, 1 : Abnormal	Over Time 시 Abnormal
22	Head2 Alarm	1	0 : Normal, 1 : Head Fail, 3 : Comm out, 4 : Head Connect Alarm	0 이외 Abnormal
24 ~ 28	Head2 Run Time	5	00000 ~ 99999 Hour	
30	Head3 Connect	1	1 : Normal, 0 : Abnormal	0 : Head Not Con 1 : Head Con (초기 연결 판단)
32	Head3 Over Time	1	0 : Normal, 1 : Abnormal	Over Time 시 Abnormal
34	Head3 Alarm	1	0 : Normal, 1 : Head Fail, 3 : Comm out, 4 : Head Connect Alarm	0 이외 Abnormal
36 ~ 40	Head3 Run Time	5	00000 ~ 99999 Hour	
42	Head4 Connect	1	1 : Normal, 0 : Abnormal	0 : Head Not Con 1 : Head Con (초기 연결 판단)
44	Head4 Over Time	1	0 : Normal, 1 : Abnormal	Over Time 시 Abnormal
46	Head4 Alarm	1	0 : Normal, 1 : Head Fail, 3 : Comm out, 4 : Head Connect Alarm	0 이외 Abnormal
48 ~ 52	Head4 Run Time	1	00000 ~ 99999 Hour	
54	Controller Interface State	1	0 : Interlock Off, 1 : Interlock On	
56	Controller Remote State	1	0 : Remote Off, 1 : Remote On	
58	Controller Power State	1	0 : Power Off, 1 : Power On	

60	Controller Alarm State	1	0 : Normal, 1 : Head Fail, 3 : Comm out, 4 : Head Connect Alarm	Head Alarm 1개 이상 발생 시 Abnormal
62	Controller Run/Stop State	1	0 : Stop, 1 : Run	
63	End Code	1		
64, 65	Check Sum	2	Check Sum	
66, 67	Carriage Return, Line Feed	2		

2. Control [Run]				통신장비 → SXC-154NH									
Byte	0	1	2	3	4	5	6	7	8	9	10	11	12
Code	\$	P	M	,	R	U	N	,	A	*	Checksum	CR	LF

2. No Receive				통신장비 ← SXC-154NH									
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3. Control [Stop]				통신장비 → SXC-154NH									
Byte	0	1	2	3	4	5	6	7	8	9	10	11	12
Code	\$	P	M	,	S	T	P	,	A	*	Checksum	CR	LF

3. No Receive				통신장비 ← SXC-154NH									
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4. Version				통신장비 → SXC-154NH									
Byte	0	1	2	3	4	5	6	7	8	9	10	11	12
Code	\$	P	M	,	V	E	R	,	A	*	Checksum	CR	LF

Byte	Information	Byte	Comment	Remarks
0	Start Code	1		
1	Product Type	1	Photo Type Ionizer	E : SXC-10BT, SXC-154NH
2	Ionizer Model	1		Head 개수에 따라 구분 (최대 4개까지 연결)
1,2	Broadcasting	2	ZB	제품군, 제품명 상관없이 응답
4,5,6	Command	3		0 : Head Not Con 1 : Head Con (초기 연결 판단)
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		

4. Version				통신장비 ← SXC-154NH (컨트롤러 Type 설정 4)									
Byte	0	1	2	3	4	5	6	7	8	9	10	11	12
ASCII	\$	P	M	,	A	,	R	,	U	,	D	,	C
Byte	14	15	16	17									
ASCII	Checksum	CR	LF										

Byte	Information	Byte	Comment	Remarks
0	Start Code	1		
1	Product Type	1	Photo Type Ionizer	E : SXC-10BT, SXC-154NH
2	Ionizer Model	1	15kV : q ~ t	Head 개수에 따라 구분 (최대 4개까지 연결)
4	Address	1	Photo : 1 ~ 16	1,2,3,4,5,6,7,8,9,A,B,C,D,E,F,G
6	Release	1		
8	Update	1		
10	Debug	1		
12	Compile	1		
13	End Code	1		0 : Head Not Con 1 : Head Con (초기 연결 판단)
14,15	Check Sum	2	Check Sum	
16,17	Carriage Return, Line Feed	2		

Checksum Calculation	
\$ ~ * Calculation	
#include<stdio.h>	
void main()	
{	
char packet[] = "Eq,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("packet[%d] = %c, cksum = %.2x\n", i, packet[i], cksum);	
}	
printf("Request : \$Eq,REQ,1*%2X", cksum); //Checksum character send by ASCII.	
}	

* Checksum 검사는 \$표시 이후부터 *표시 전까지의 모든 데이터를 Exclusive-or 연산한 것입니다.

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