# Instruction Manual

SUNJE

## SBP-4N

Eng

It is recommended that only persons who have sufficient knowledge and experience such as system designers and responsible persons deal with this product after carefully reading the product manual.

## 1 The matters of safety

**⚠ WARNING**

* If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
* Do not let the water touch the product. It may cause electric shock or fire due to malfunction.
* When you check or maintain the product, make it sure you turn off the power. It may cause electric shock or fire due to malfunction.
* The item should be fixed to the target tightly. Electric discharging or breakage might happen.
* Do not use the product at the place where dangerous material such as inflammable or ignitable material exists. This product is not the product of anti-explosive type.
* This device is made only for industrial uses. You need to ground the device beforehand. Otherwise, there are in case of malfunction, electric shock, or fire damage.

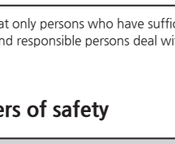
**! CAUTION**

* Do not disconnect the controller cable with power applied. There is a possibility of electric shock or malfunction.
* Connect wires referring to the product manual. Wrong connection can cause failures.
* For your proper cable connection, take a look at the manual「Installation & Connection」for references. Any disordered connection is detected, the malfunction might arise.
* All cables should be connected all the time. Please careful of cable disconnections. If power or communication cables got damaged, replace them immediately. Malfunction and fire danger may happen.
* Do not install the device where the vibration can be detected. Any minor impact or vibration on the device, the malfuction or danger of accident might happen.
* Do not use the item off the range of usage(Electrostatic elimination). Malfunction or danger of accident may occur.

## 2 Check the package contents

▶ **Product compositions**

The package includes the following products composition.

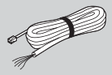


Controller
**SBP-4N**
1ea

Power Cable
**SPC-MT-1-001**
AC 100V, 50/60Hz,
1.8m / 1ea

or

Power Cable
**SPC-MT-2-001**
AC 220V, 50/60Hz,
1.8m / 1ea



Signal Cable
**SUC-MT-2-001**
5m

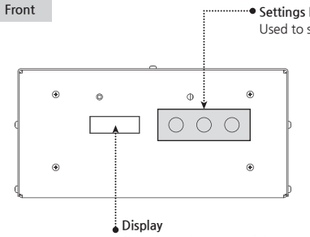
UTP Cable
**SUC-B3-1-001**
5m

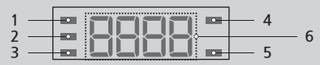

Ground Cable
**SGC-MT-6-001**
1m /Ø4-Ø6[mm] /
1~2ea



## 3 Nomenclatures of parts

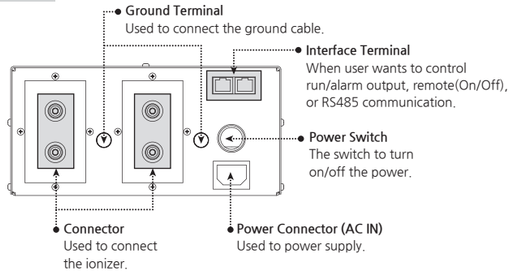
Front




1. TX (Red) / RX (Green)
2. Tip Clean Alarm
3. HV Alarm
4. HV-2 Pos. Freq
5. HV-1 Neg. Freq
6. Show the menu and alarm.

Rear




## 4 Installation and connection

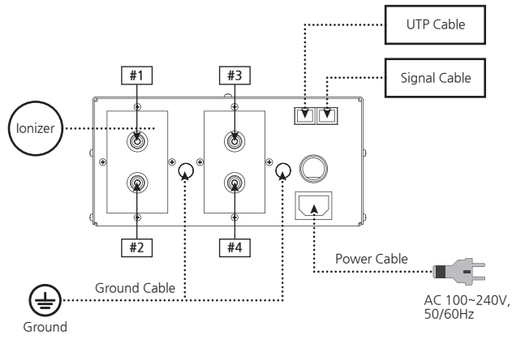
**! CAUTION**

* During installation, please try to avoid the area where the product might get(electrical) stress. There might be chances for cable breakage, electric shock, or fire explosion.
* Please be sure to use a ground cable for safety purposes.

▶ **How to connect**

Refer to the figure below to connect the product.

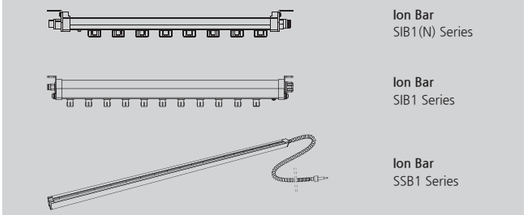
Rear






▶ **Connectable products**

The SBP-4N Series can be connected to the (multiple) products as below.



Ion Bar
SIB1(N) Series

Ion Bar
SIB1 Series

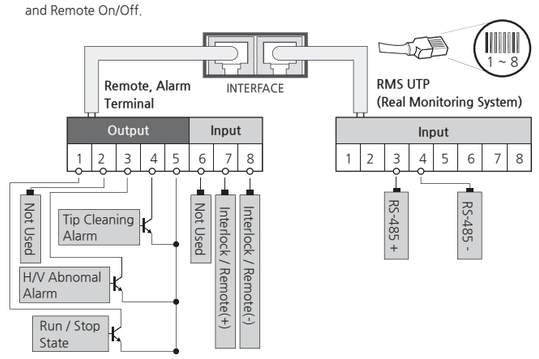
Ion Bar
SSB1 Series

▶ **How to connect the interface (Signal Cable)**

For the specification of the signal cable to be used, refer to the table below.

**RS-485 & Interface Terminal**

This is a terminal for controlling RS-485 data communication, the status (operation/stop) of the Ion Bar, alarm output (Over current Alarm, Tip cleaning timer Alarm), and Remote On/Off.




**RMS UTP (Real Monitoring System)**

| No | Color | Descriptions |
|---|---|---|
| 1 | Brown | Not Used |
| 2 | White & Brown | |
| 3 | Orange | RS-485+ |
| 4 | White & Orange | RS-485- |
| 5 | Green | Not Used |
| 6 | White & Green | |
| 7 | Blue | |
| 8 | White & Blue | |

**Remote, Alarm Terminal**

| No | Color | Function | Output | Picture |
|---|---|---|---|---|
| 1 | Brown | Run / Stop State | Photo Relay Output (Run-Close, Stop-Open) | Run / Stop |
| 2 | White & Brown | - | - | - |
| 3 | Orange | High Voltage Abnormal | Photo Relay Output (Normal-Open, Alarm-Close) | Normal / Alarm |
| 4 | White & Orange | Tip Cleaning Alarm | Photo Relay Output (Normal- Open, Alarm-Close) | Normal / Alarm |
| 5 | Green | Common | - | - |
| 6 | White & Green | - | - | - |
| 7 | Blue | Remote(+) | DC 24V | - |
| 8 | White & Blue | Remote(-) | Ground | - |

※ The remote stops when the input signal (DC24V) is received.



▶ **Communication Protocol**

| 1. DATA Request | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Byte | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| Code | $ | B | C | , | R | E | Q | , | A | * | h | h | ₩r | ₩n |

| Byte | Information | Byte | Comment | Remarks |
|---|---|---|---|---|
| 0 | Start Code | 1 | | |
| 1 | Product Type | 1 | B(Bar Type Ionizer) | A:Photo, B:Bar, C:Blower |
| 2 | Ionizer Model | 1 | C | SBP-N Series |
| 4, 5, 6 | Data Request | 3 | REQ | Command(REQ,RUN,STP) |
| 8 | Bar Address | 1 | 1,2,3,4,5,6,7,8,9,A,B,C,D,E,F,G | 1 ~ 16 : '1' ~ 'G' |
| 9 | End Code | 1 | | |
| 10, 11 | Check Sum | 2 | Check Sum | |
| 12, 13 | Line Feed, New Line | 2 | | |

| 1. DATA Receive | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Byte | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| Code | $ | B | C | , | A | , | 1F | , | 1D | , | 1H | , | 2F | , |
| Byte | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | | |
| Code | 2D | , | 2H | , | A/S | , | R/S | * | h | h | ₩r | ₩n | | |

| Byte | Information | Byte | Comment | Remarks |
|---|---|---|---|---|
| 0 | Start Code | 1 | | |
| 1 | Product Type | 1 | B(Bar Type Ionizer) | A:Photo, B:Bar, C:Blower |
| 2 | Ionizer Model | 1 | C | SBP-N Series |
| 4 | Address | 1 | 1,2,3,4,5,6,7,8,9,A,B,C,D,E,F,G | 1 ~ 16 : '1' ~ 'G' |
| 6 | HV1 Frequency | 1 | 0,1,2,3,4,5,6,7,8,9,A,B,C | 0.1,0.3,1,3,5,8,10,20,30,35 ,40,50Hz : '0'~'9', 'A'~'C' |
| 8 | HV1 Duty | 1 | ASCII : '(' [40] ~ 'd' [100] | 40 ~ 70% |
| 10 | HV1 High Voltage | 1 | 1 ~ 10 | 1 : 8.0 ~ 10 : 12.5 |
| 12 | HV2 Frequency | 1 | 0,1,2,3,4,5,6,7,8,9,A,B,C | 0.1,0.3,1,3,5,8,10,20,30,35 ,40,50Hz : '0'~'9', 'A'~'C' |
| 14 | HV2 Duty | 1 | ASCII : '(' [40] ~ 'd' [100] | 40 ~ 70% |
| 16 | HV2 High Voltage | 1 | 1 ~ 10 | 1 : 8.0 ~ 10: 12.5 |
| 18 | Alarm State | 1 | Normal : 0, HV1-AL : 1, HV2-AL : 2, HVALL-AL : 3, TipClean : 4 | |
| 20 | Run/Stop State | 1 | Stop : 0, Run : 1, HV1-AL : 2, HV2-AL : 3 | |
| 21 | End Code | 1 | | |
| 22, 23 | Check Sum | 2 | Check Sum | |
| 24, 25 | Carriage Return, Line Feed | 2 | | |

※ 12, 14, 16 Byte '_' in 2-channel (HV2) mode

| 1. Comm Sample | |
|---|---|
| Request | $BC, REQ, 9*0F₩r₩n |
| Receive | $BC, 9, 6, <, 6, 6, <, 6, 0, 1*6C₩r₩n |

- Addr : 9
- Bar 1 Freq : 6(10Hz) = Bar 2
- Bar 1 Duty : <(60%) = Bar 2
- Bar 1 HV : 6(10.5kvpp) = Bar 2
- Alarm : 0(Nomal)
- Run/Stop : 1(Run)

| 2. Control [Run] | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Byte | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| Code | $ | B | C | , | R | U | N | , | A | * | h | h | ₩r | ₩n |

2. No Receive

| 3. Control [Stop] | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Byte | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| Code | $ | B | C | , | S | T | P | , | A | * | h | h | ₩r | ₩n |

3. No Receive

**Checksum Calculation**

$ ~ * Calculation

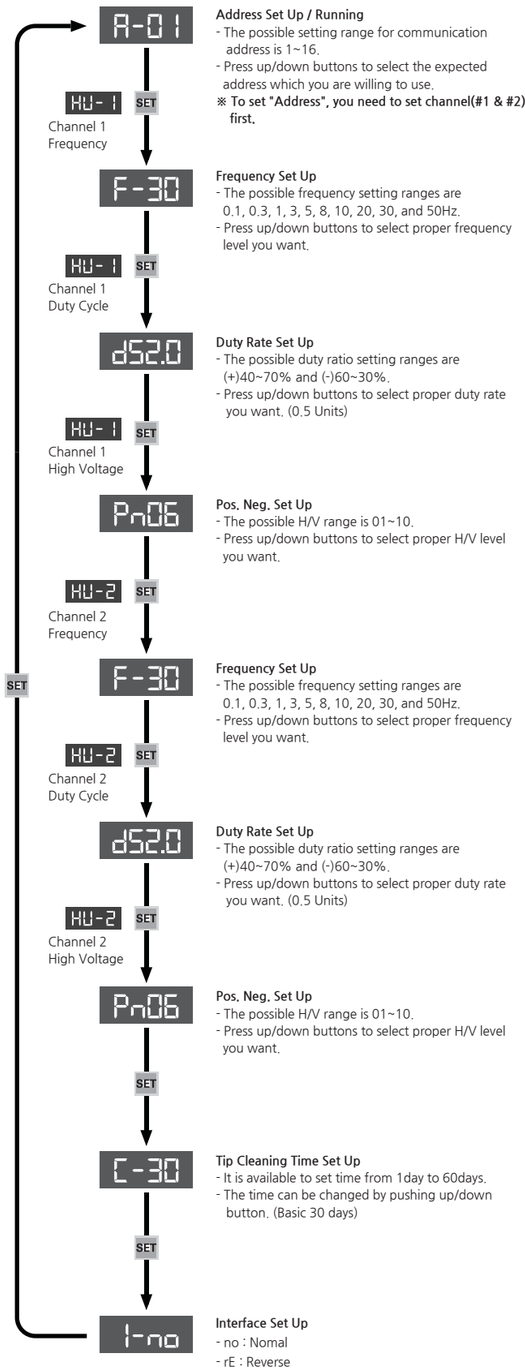
```
#include<stdio.h>

Void main()
{
   char packet[] = "BC,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, checksum = %.2x₩n", i, packet[i], cksum);
   }
   printf("Request : $BC,REQ,1*%.2X",cksum); //Checksum character send by ASCII.
```



## 5 How to set

**⚠ WARNING**

* Do not tamper with the set value. The malfunction might arise.




**Address Set Up / Running**
- The possible setting range for communication address is 1~16.
- Press up/down buttons to select the expected address which you are willing to use.

※ **To set "Address", you need to set channel(#1 & #2) first.**

**Frequency Set Up**
- The possible frequency setting ranges are 0.1, 0.3, 1, 3, 5, 8, 10, 20, 30, and 50Hz.
- Press up/down buttons to select proper frequency level you want.

**Duty Rate Set Up**
- The possible duty ratio setting ranges are (+)40~70% and (-)60~30%.
- Press up/down buttons to select proper duty rate you want. (0.5 Units)

**Pos, Neg, Set Up**
- The possible H/V range is 01~10.
- Press up/down buttons to select proper H/V level you want.

**Frequency Set Up**
- The possible frequency setting ranges are 0.1, 0.3, 1, 3, 5, 8, 10, 20, 30, and 50Hz.
- Press up/down buttons to select proper frequency level you want.

**Duty Rate Set Up**
- The possible duty ratio setting ranges are (+)40~70% and (-)60~30%.
- Press up/down buttons to select proper duty rate you want. (0.5 Units)

**Pos, Neg, Set Up**
- The possible H/V range is 01~10.
- Press up/down buttons to select proper H/V level you want.

**Tip Cleaning Time Set Up**
- It is available to set time from 1day to 60days.
- The time can be changed by pushing up/down button. (Basic 30 days)

**Interface Set Up**
- no : Nomal
- rE : Reverse

※ Once your setup is done, the device will automatically save your current setup value immediately (within 3 second).



▶ Alarm status information

| | | | |
|---|---|---|---|
| al-1 | : HV1- Alarm | al-2 | : HV2- Alarm |
| al-3 | : HVALL- Alarm | al-4 | : Tip Clean Alarm |

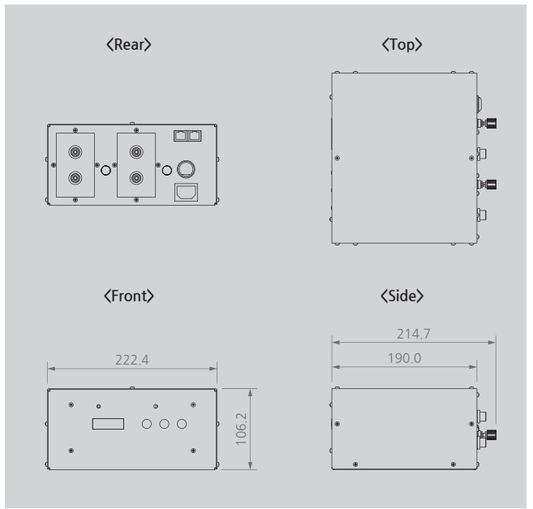
※ When HV1 or HV2 Alarm occurs, the normal port continues outputting. However, settings cannot be changed.

## 6 Problem solving

▶ Checklist before called

| Problem | Identifying Problem | Solution |
|---|---|---|
| **The product does not work.** | Is your power cable still plugged in? | Please re-plug the power cable and then turn the device on again. |
| | Was the proper voltage level applied for this set-up? | Please use the proper level of power input for the device. (AC 100~240V, 50/60Hz) |
| | Is the swith off at back of the device? | Turn on the power switch. |
| | Is a fuse broken? | Replace the proper fuse immediately. (250V, 1A) |
| **There is no ionization.** | Does the installed environment have too high/low level of humidity or temperature? | Please install the device upon the proper working specification. |
| **The ionizing performance has been decreased.** | Can't possibly ground the device? | Please refer to「Installation & Connection」for grounding the device. |
| | Any damages or cut on the cables? | You need to replace the cables if it gets cut or damaged. |

## 7 Dimensions






## 8 Specification

| Parameter | | Description / Value |
|---|---|---|
| Input Power | | AC 100~240V, 50/60Hz |
| Output Voltage | | Pulse AC 13 kVp-p(Max.) |
| Power Consumption | | 30W |
| Weight | | 2.81kg |
| Main Body Material | | EGI |
| Operation Circumstance | | 0℃ ~ +50℃(32℉ ~ 122℉), 35% ~ 85% RH |
| Adjust Function | Frequency [Hz] | 0.1, 0.3, 1, 3, 5, 8, 10, 20, 30, 50(10Steps) |
| | Duty Ratio [%] | 40~70(0.5 Unit) |
| | High Voltage [Level] | H : 1~10(1 Unit) |
| Interface | | Remote On/Off, Run State, H/V Alarm State, RS485 |
| Warranty | | 1 year |

※ The appearance and specification of the product may be changed without prior notice for the improvement of the product.

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