

Instruction Manual

CPM (Charged Plate Monitor)

SCM-10A

☐ Kor

☒ Eng

☐ Jap

☐ Chi

☐ Tai

SUNJE

Product Warranty Certificate

Sunje Co., Ltd. provides product warranty as follows in accordance with the Consumer Dispute Resolution Standards.

Product Name	CPM		
Model Name			
Serial No.			
Purchase Date	Year	Month	Day
Customer Name	TEL.		
Warranty Period	One year from the date of purchase		

1. If a malfunction occurs due to a manufacturing defect during the warranty period while the product is being used normally, free service will be provided.
2. In case of malfunction, please contact us.
 - ▶ Sales Department: Tel) 82-31-203-9034
3. Even during the warranty period, repairs will be charged in the following cases:
 - ▶ Malfunctions caused by user negligence, improper repair, or modification
 - ▶ Malfunctions resulting from failure to follow the instructions specified in the user manual
4. After the warranty period has expired, paid repair service is available.
5. When requesting repair, please present this warranty certificate with the purchase date indicated.
6. The warranty certificate will not be reissued, so please keep it safe.

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These safety precautions are intended to protect users and prevent property damage and other losses. Before using the product, read this manual thoroughly and use the product correctly.

1 The matters of safety

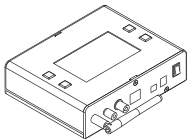
WARNING

- * Do not modify or repair the product yourself. Doing so may cause malfunction, electric shock, or fire. If service is required, please contact us.
- * Keep the product away from water.
Contact with liquids may cause malfunction, electric shock, or fire.
- * Do not subject the product to impacts such as dropping or vibration; this may cause a failure.
- * This product is a precision measuring instrument;
proper grounding is required for optimal performance.
- * Always turn off and disconnect the main power before inspection or maintenance.
Failure to do so may result in malfunction, electric shock, or fire.
- * Do not use the product outside its intended purpose or specified operating conditions.
Such use may cause failure or shorten the product's service life.
- * Make all wiring connections according to the installation instructions in this manual.
Incorrect wiring may cause failure or abnormal operation.
- * Handle the power and communication cables with care, as they may break.
- * If the power or communication cables are damaged, replace them immediately. Damaged cables may cause leakage current, communication failures, or abnormal operation.
- * When disposing of this product, treat it as industrial waste in accordance with applicable regulations.

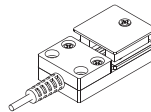
2 Check the package contents

► Product compositions

The package includes the following products composition.



- * CPM
SCM-10A
1ea



- * Plate
(25*25mm)
SCP-MT-1-001
1ea



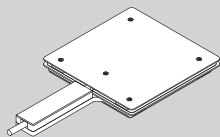
- * Adapter
(24VDC, 2.0A)
SAD-CM-1-001
1ea



- * Ground Cable
(1m / Ø4-Ø6)
SGC-MT-4-001
1ea

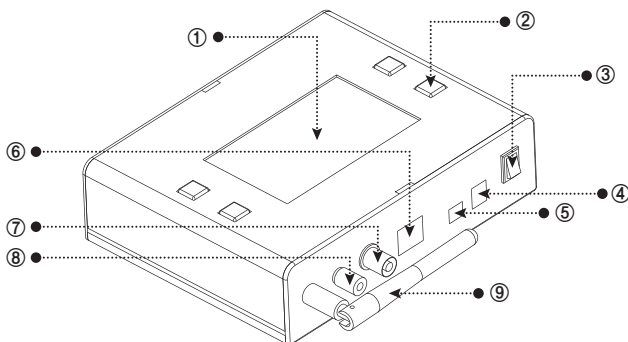
► Option

If you require extra functions with the basic accessories we provided, you need to purchase optional items in below for further assistant.



* Plate
(150*150mm)
SCP-MT-1-002
1ea

3 Nomenclatures of parts



① LCD Display: Displays measurement values, settings, and other information.

② Buttons (4): Used to configure settings and execute operations.

③ Power Switch: Turns the power on/off.

④ Power Adapter DC Jack: Used to supply power.

⑤ Communication Port (RS-485): For RS-485 communication.

RS-485



※ Please check the positions of the (+) and (-) carefully.

⑥ Communication Port (Ethernet): For Ethernet communication.

⑦ Plate Connection Connector: Terminal for connecting the plate.

⑧ Ground Terminal: Terminal for grounding the product.

⑨ Wi-Fi Antenna.

4 Installation and connection

! CAUTION

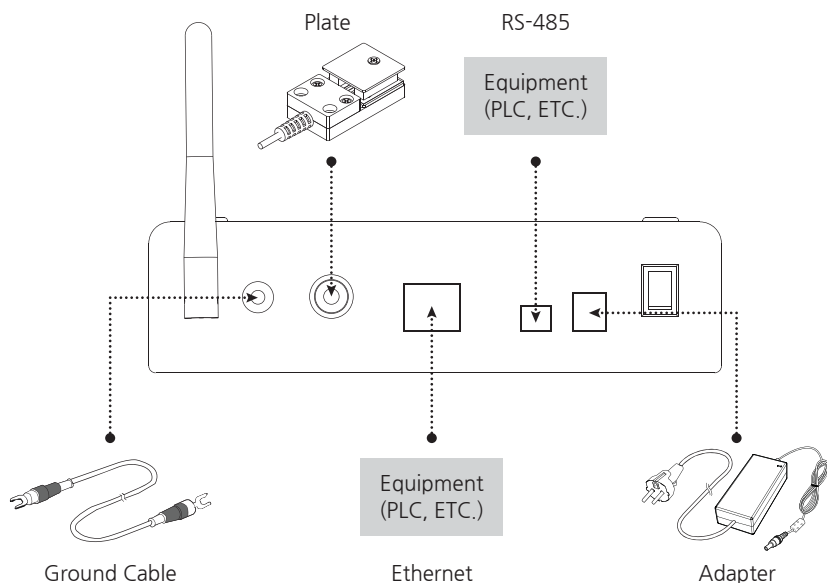
- * Install the product to suit the operating environment. The mounting surface must be flat.
- * Do not install it in high-temperature or high-humidity environments.
- * Static-neutralization performance may decrease depending on the surroundings. Install the product with consideration for the environment around the target to be neutralized.
- * Verify the power specifications and supply the correct power.

Incorrect connections may cause fire or electric shock.

- * To prevent electric shock and ensure proper operation, make sure the product is properly grounded.

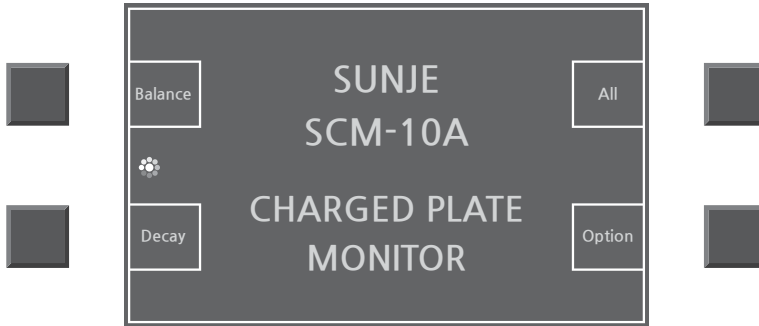
► How to Connect

Refer to the diagram below to connect the product.



5 Default Configuration Screen and Settings Menu

► Main Screen



Balance button: Goes to the screen that measures the ionizer's ion balance.

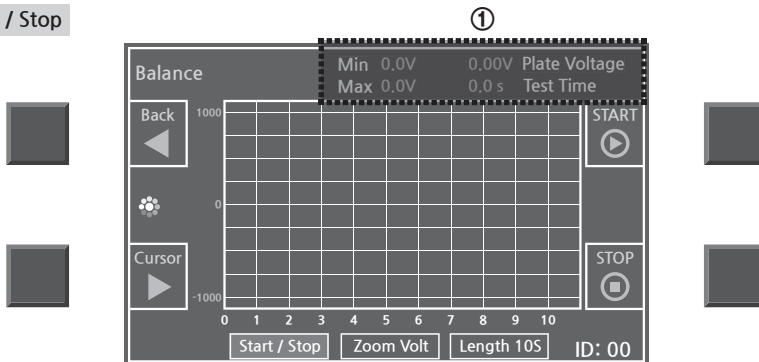
Decay button: Goes to the screen that measures the performance of the ionizer.

All button: Goes to a screen that measures the ionizer's ion balance and performance at the same time.

Option button: Goes to the screen where you set the details.

► Balance

Start / Stop



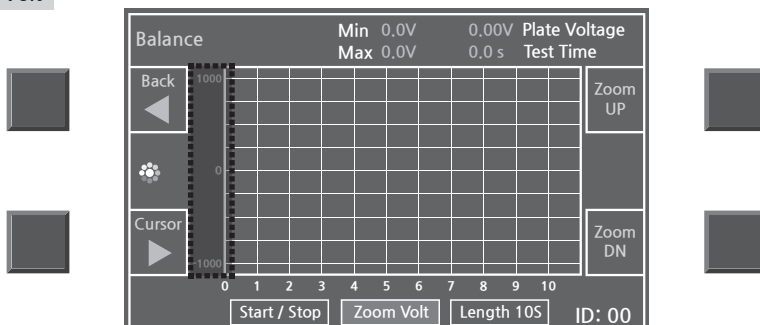
Press the Balance button on the main screen.

Press the Cursor button to go to the Start/Stop menu at the bottom.

Press the Start or Stop button on the right side of the menu to enable or stop the CPM.

Region ① displays the ionizer's ion balance value and the settings information in real time.

Zoom Volt

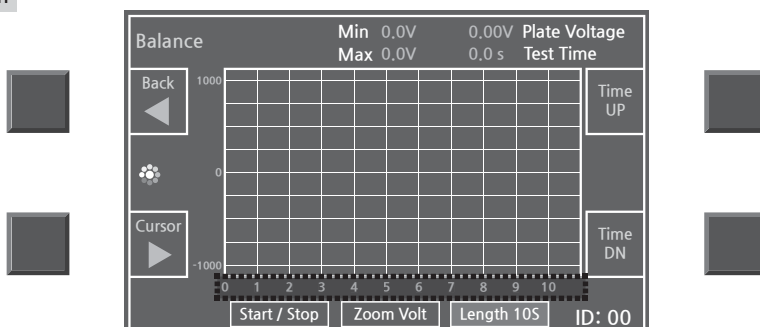


Press the Cursor button to go to the Zoom Volt menu at the bottom.

Press the Zoom Up and Zoom DN buttons on the right side of the menu to adjust the range.

This menu sets the Y-axis scale (voltage). Set range: ± 50 , ± 100 , ± 200 , ± 500 , ± 1000 .

Length



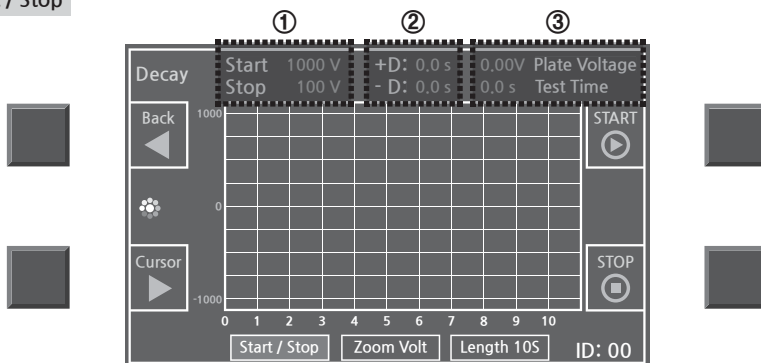
Press the Cursor button to go to the Length menu at the bottom.

Press the Time Up and Time DN buttons on the right side of the menu to adjust the time.

This menu sets the X-axis scale (time). Set range: 5 s, 10 s, 30 s, 60 s.

► Decay

Start / Stop



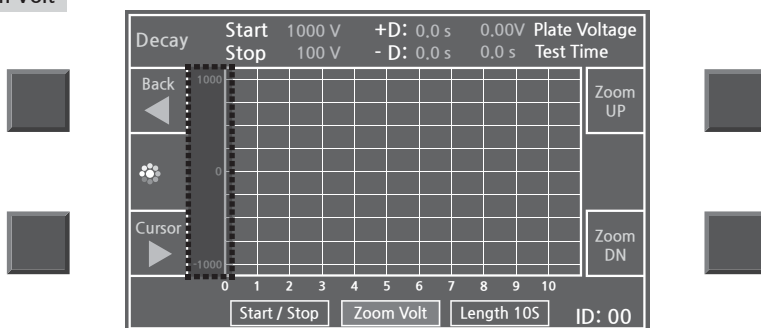
Press the Decay button on the main screen.

Press the Cursor button to go to the Start/Stop menu at the bottom.

Press the Start or Stop button on the right side of the menu to enable or stop the CPM.

- ① The area displays the set Start/Stop voltage.
- ② The area displays the ionizer's performance after the measurement is completed.
- ③ The area displays the set information in real time.

Zoom Volt

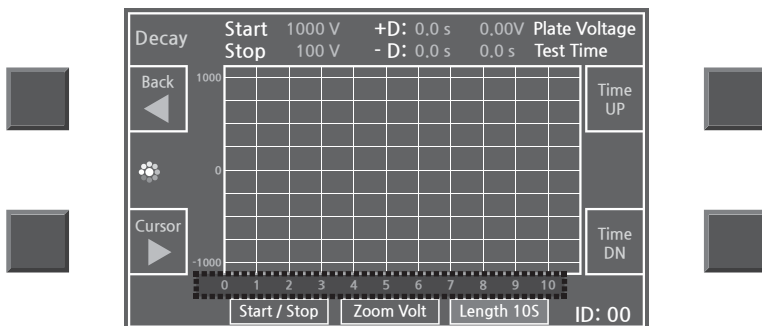


Press the Cursor button to go to the Zoom Volt menu at the bottom.

Press the Zoom Up and Zoom DN buttons on the right side of the menu to adjust the range.

This menu sets the Y-axis scale (voltage). Set range: ± 50 , ± 100 , ± 200 , ± 500 , ± 1000 V.

Length



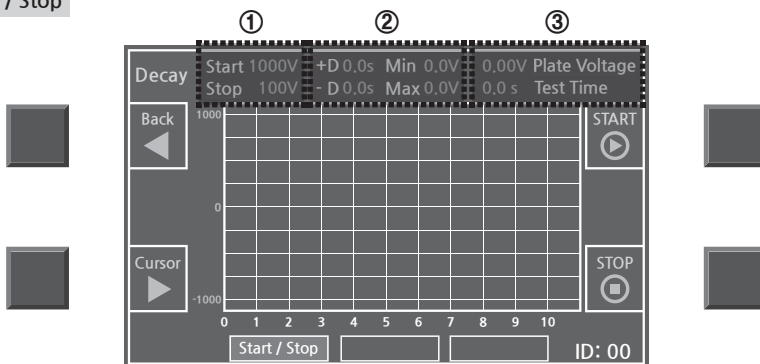
Press the Cursor button to go to the Length menu at the bottom.

Press the Time Up and Time DN buttons on the right side of the menu to adjust the time.

This menu is used to set the X-axis scale (time). Set range: 5, 10, 30, 60s.

► All

Start / Stop



Press the All button on the main screen.

Press the Cursor button to go to the Start/Stop menu at the bottom.

Press the Start or Stop button on the right side of the menu to enable or stop the CPM.

① The area displays the set Start/Stop voltage.

② The area shows the ionizer's performance and ion balance after the measurement is completed.

③ The area displays the set information in real time.

※ Order of operation

Start → Plate grounding for 3 seconds → Graph initialization → Balance measurement → +Decay → -Decay

► Option

ID



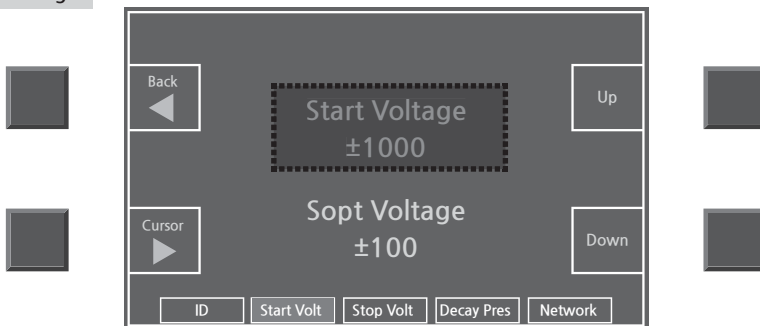
On the main screen, press the Option button.

Press the Cursor button to go to the ID menu at the bottom, which is set when using communication.

Press the Up or Down button on the right side of the menu to set the CPM's ID.

Up to eight units can be connected.

Start Voltage

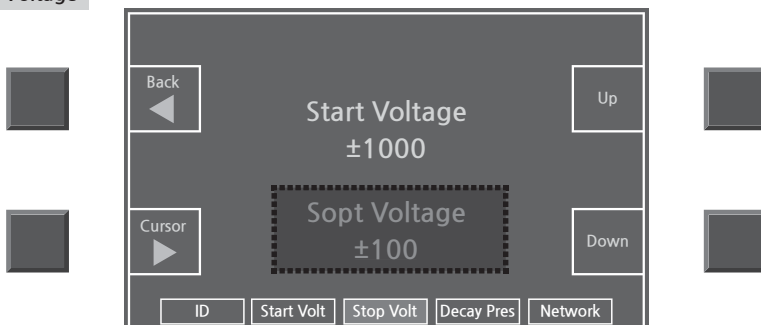


Press the Cursor button to go to the Start Volt menu at the bottom.

Press the Up and Down buttons on the right side of the menu to set the decay start voltage.

(Voltage set range: 10 V)

Stop Voltage

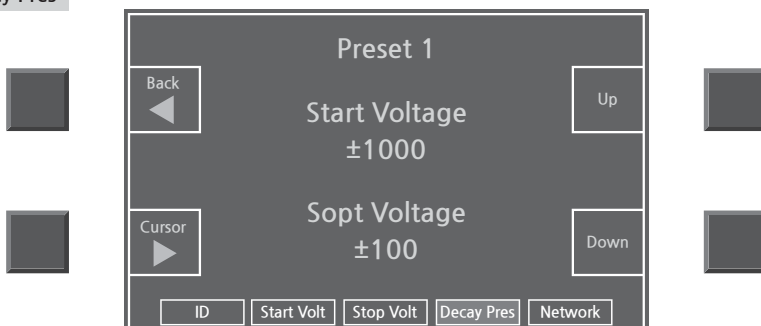


Press the Cursor button to go to the Stop Volt menu at the bottom.

Press the Up and Down buttons on the right side of the menu to set the decay end voltage.

(Voltage set range: 10 V)

Decay Pres



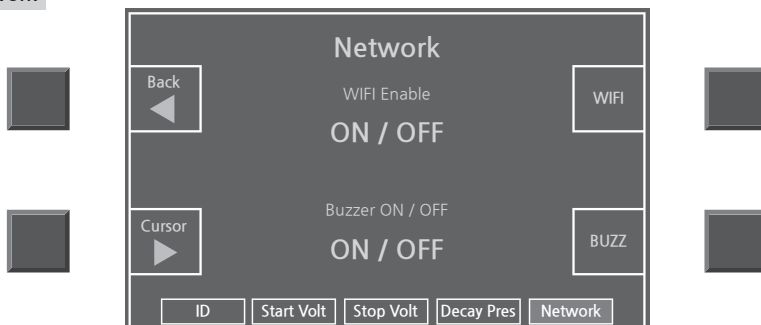
Press the Cursor button to go to the Decay Press menu at the bottom.

Press the Up and Down buttons on the right to select a preset decay start and end voltage from the menu.

There are five preset types available (see the table below).

Preset	1	2	3	4	5
Start V	±1000	±500	±300	±1000	±200
Stop V	±100	±50	±30	±50	±25

Network



Press the Cursor button to go to the Network menu at the bottom.

Press the WIFI or BUZZ button on the right side of the menu to set each function.

* WIFI Enable: Enables or disables Wi-Fi functionality.

* BUZZER ON/OFF: Enables or disables the button operation sound.

6 Communication Protocol (V1.0.1.0)

Memory Address	Category	Data Address		Start Address		Description	Setting Range		Shipping Spec.		Read / Write
		Dec	Hex	Dec	Hex		Min	Max	Dec	Hex	
Input register (16 bits)	Field Value	32768	8000	0	0	-1500.0V ~ 1500.0V Decay, read-only when balance is in operation	-32768	32768	0	0	Read Only
	Reserved	32769	8001	1	1						Reserved
	Balance Time (Balance field value)	32770	8002	2	2	-1500.0V ~ 1500.0V Data is read after 2× the operating time. (Ex: If Balance is set to 30s → data is read after 60s.)	-32768	32768	0	0	Read Only
	+ Peak Value	32771	8003	3	3	-1500.0V ~ 1500.0V	-32768	32768	0	0	Read Only
	- Peak Value	32772	8004	4	4	-1500.0V ~ 1500.0V	-32768	32768	0	0	Read Only
	Balance Time (Balance time setting)	32773	8005	5	5	5, 10, 30, 60s Balance set time, set by the controller or through communication	0	60	5	5	R/W
	Reserved	32774	8006	6	6						Reserved
	Reserved	32775	8007	7	7						Reserved
	Decay Time Setting	32776	8008	8	8	15, 30, 60, 90, 180s Data is read after 2× the operating time	0	180	5	5	R/W
	Plus Span (+ field value calibration)	32777	8009	9	9	Factory + High Voltage Value Calibration	1	3000	-	-	R/W

Input register (16 bits)	Minus Span (- Field value calibration)	32778	800A	10	A	Factory - Calibrate high voltage values	1	3000	-	-	R/W
	Decay + Time	32779	800B	11	B	0.00~60.00 sec Over Time on 60.00	0	6000	0	0	Read Only
	Decay - Time	32780	800C	12	C	0.00~60.00 sec Over Time on 60.00	0	6000	0	0	Read Only
	Reserved	32781	800D	13	D						Reserved
	Reserved	32782	800E	14	E						Reserved
	Reserved	32783	800F	15	F						Reserved
	Balance Run	32784	8010	16	10	0: Stop, 1: Run Balance * Measurement after 2x operating time	0	1	0	0	R/W
	Decay Run	32785	8011	17	11	0: Stop, 1: Run Balance * Measurement after 2x operating time	0	1	0	0	R/W
	Decay Status	32786	8012	18	12	0: Stop, 1: 1 output after decay is completed * Data Read flag	0	1	0	0	R/W
	Reserved	32787	8013	19	13						Reserved

► Measurement Sequence

Balance Measurement Procedure

1. Setting the Balance Time

Set the desired operation time (select from 5, 10, 30, 60s) in the Balance Time register (address: 8005). If you do not change the setting, the previously specified value remains and is applied.

2. Balance Execute Command

After setting the time, write 1 to the Balance Run register (address: 8010) to start the balance measurement.

※ Caution: The measurement result is applied after twice the set time has elapsed since the command was executed.

3. Check the Measured Value

After waiting sufficiently, read the Balance register (address: 8002) to obtain the measured field value. The value ranges from -1500.0 V to +1500.0 V. If necessary, you can also check the maximum peak values using the Peak Plus (address: 8003) and Peak Minus (address: 8004) registers.

Decay Time Measurement Procedure

1. Set Decay Time

Set the desired measurement time (e.g., 15, 30, 60, 90, 180s) in the Decay Time register (address: 8008).

If you do not change the setting, the previously specified value remains applied.

2. Decay Execute Command

After setting the time, write 1 to the Decay Run register (address: 8011) to start the decay measurement.

※ Caution: The measurement result is applied after twice the set time has elapsed since the command was executed.

3. Standby

The instrument performs a decay measurement for twice the set time.

During this period, the user must wait for the measurement to complete.

4. Measurement Completed and Result Verification

After waiting, check the Decay Status register (address: 8012).

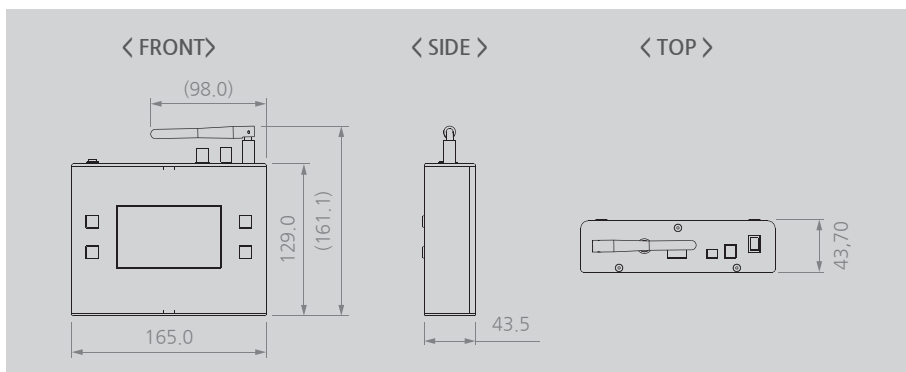
If the value is 1, the measurement is complete.

After completion, the measurement time and calibration values can be checked using Decay + Time (address: 800B) and Decay - Time (address: 800C).

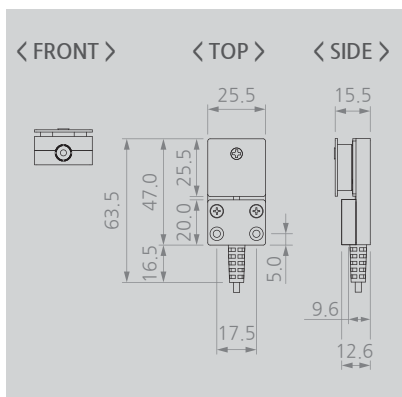
Additionally, you can check the maximum peak values using Peak Plus (address: 8003) and Peak Minus (address: 8004).

7 Dimensions

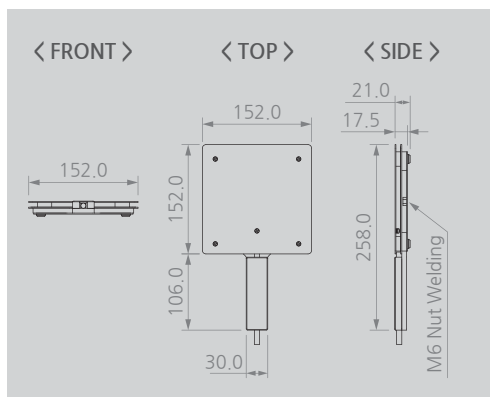
► SCM-10A



► Plate(25*25mm)



► Plate(150*150mm)_Option



8 Specification

Parameter		Description / Value	
Performance	Monitoring Voltage Range	0 to ±1100 VDC or peak AC	
	Decay Mode Threshold	Start Voltage	Can be set in 10V increments within the range of 100 to ±1000 V
		Start Accuracy	Within ±1V of the set starting voltage
		End Voltage	Can be set in 1V increments within the range of 10 to ±100 V
		End Accuracy	Within ±1V of the set ending voltage
		Discharge Time Resolution	0.1 sec
Mechanical Specifications	Dimensions (W × H × D)	165 × 129 × 43.5 mm	
	Voltage Monitor	BNC Connector	
	Ground Terminal	Binding ground post	
	Cable between equipment and floating plate	Coaxial Cable Type	
		150 × 150 plate, diameter 5.6 mm, length 3 m 25 × 25 plate, diameter 2.8 mm, length 5 m	
	Input Power	External Adapter (24 VDC, 2.0 A)	
	LCD Display	3.97-inch LCD	
Electrical Specifications	Analysis Resolution	12-bit resolution	
Features	Mode Selection / Programming	A variety of predefined tests can be performed automatically, and previous test parameters, test locations, and test results can all be saved or retrieved.	
	Ion Collection Plate	Meets ANSI/ESD-STM3.1 standard	
	Remote Control / Monitoring	Up to 8 devices can be connected via Modbus protocol in a daisy-chain configuration	
	Decay Mode	The Decay Mode functionality of the CPM is designed to quantitatively assess the electrostatic neutralization efficiency of the ionizer. By measuring the time required for the charged plate potential to dissipate, the neutralization performance in a controlled environment can be accurately and reliably evaluated. ► Operation Stages 1. Charging Phase Charge the ion collection plate to the pre-set start voltage. 2. Decay Process After charging, the plate voltage is gradually reduced through ion collisions until it reaches 0 V or the specified termination voltage. 3. Time Measurement Accurately measure the time taken for the voltage to change from the start voltage to the end voltage, and display the result on the equipment screen. 4. Polarity Evaluation Evaluate the Decay time for both positive and negative polarities. (+) Decay: Time required for the positively charged plate to discharge to 0 V. (-) Decay: Time required for the negatively charged plate to discharge to 0 V.	
		Balance Mode	The balance mode function of the CPM measures the offset voltage generated by the ionizer without external charging. This mode is used to directly verify the ionizer's balance state and to evaluate whether a neutral environment can be maintained without unnecessary positive (+) or negative (-) bias. It is an important performance indicator. ► Operation Stages 1. Initialization Initialize the plate monitor voltage to 0 V ± 0.5 V to begin the measurement in a neutral state. 2. Floating Process After initialization, the plate is allowed to float freely, being influenced only by the ion impact from the ionizer, and rises or shifts to a specific voltage level. 3. Measurement The stabilized voltage reached by the plate is measured and displayed. This value represents the ionizer's characteristic balance state.



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