# Demand Controller

# SDC-500

## User Manual

Safety Precautions

11.1.2  Upgrade

Caution for safety

For safe usage of SDC-500's function full enough, Read this instruction carefully before you use.

The attention subject for the safety.

Following picture shown in product and instruction has a meaning;

Warning : Possibility of serious injury or death when violating instruction

Caution : Possibility of small injury or product damage when violating instruction.

Keep this instruction near SDC-500.

! is a symbol that tells us to be cautious of danger in certain condition.

Is a symbol that tells us to be cautious of electric shock in certain condition.

Warning

- Do not try wiring when power is on or driving.

  It becomes cause of electric shock.

- Do not try wiring when mother wire is live wire.

  It may cause electric shock, fire, or fracture due to charged voltage of converter.

- Do ground connection.

  It might cause electric shock.

- Do not disassemble product even if when power is not connected.

  It might be cause of electric shock due to charged current inside product.

- Do not touch or install product with wet hands.

  It might be cause of electric shock.

- Do not use cable which sheath is damaged.

  It might be cause of electric shock.

- Do the terminal process when tying cable.

  It might be cause of electric shock.

- When dealing with product, wear protective equipment.


1. Package checking

1.1 Main body (SDC-500)

- Main body (SDC-500) 1ea

- Power cable (220V AC) 1ea

- Communication cable (LAN) 1ea

- User instruction 1ea

- Software CD 1ea

- Terminal block protection cover 13P-2ea   10P-1ea

- Fixed bracket, screw 4ea

2. Basic composition of product

2.1 Explanation of front part
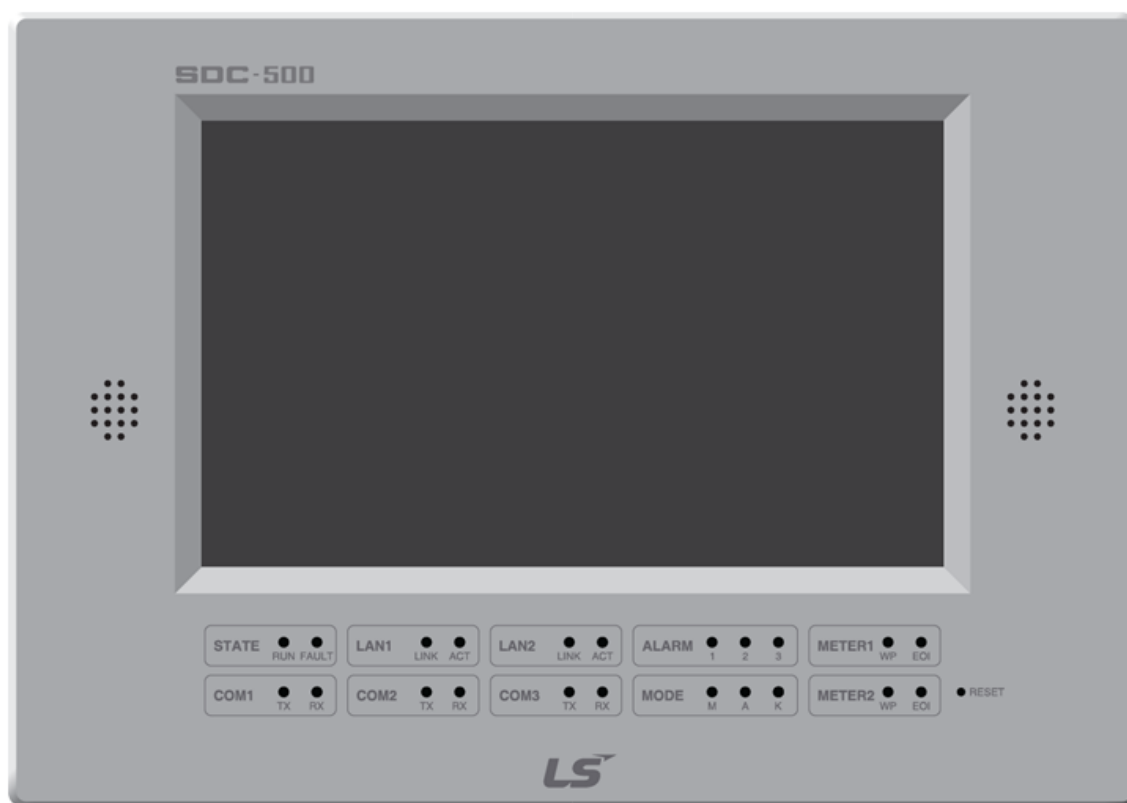
① Main display part (LCD)

It displays demand power, real-time monitoring, log, and report.
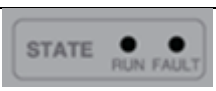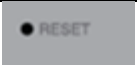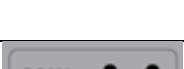
② Speaker

It emits voice when alarm or error occurs.

③ Status part (LED)

It shows control mode, watt-hour meter interface, alarm, and communication status.

| Items | Description |
|---|---|
| MODE ● ● ● M A K | It shows load control driving mode with LED light. <br><br> <table><tr><td>status</td><td>M</td><td>A</td><td></td></tr><tr><td>meaning</td><td>manual</td><td>auto</td><td></td></tr></table> |
| METER1 ● ● WP EOI | When measuring pulse signal of watt-hour meter inputs, WP LED turns on, and when demand time-limit reset |

| | |
|---|---|
| METER2 ● ● <br> WP EOI | signal inputs, EOI LED turns on. |
| ALARM ● ● ● <br> 1 2 3 | Depending on alarm status, 1, 2, 3 LED turns on. |
| STATE ● ● <br> RUN FAULT | When system is all green, RUN LED turns on, and FAULT LED turns off. <br><br> When EOI (for 960 seconds), WP (for 930 seconds) wasn't input, FAULT LED turns on. |
| ● RESET | When system doesn't work properly, press RESET to restart the system. |
| LAN1 ● ● <br> LINK ACT <br><br> LAN2 ● ● <br> LINK ACT | When Ethernet port is physically connected, LINK LED turns on, and when receiving/ sending data through Ethernet port, ACT LED turns on. |
| COM1 ● ● <br> TX RX | When sending data through COM1 (RS-232C) port, TX LED turns on, and when receiving data, RX LED turns on. |
| COM2 ● ● <br> TX RX <br><br> COM3 ● ● <br> TX RX | When sending data through COM2/3 (RS-485) port, TX LED turns on, and when receiving data, RX LED turns on. |

2.2 Explanation of back part
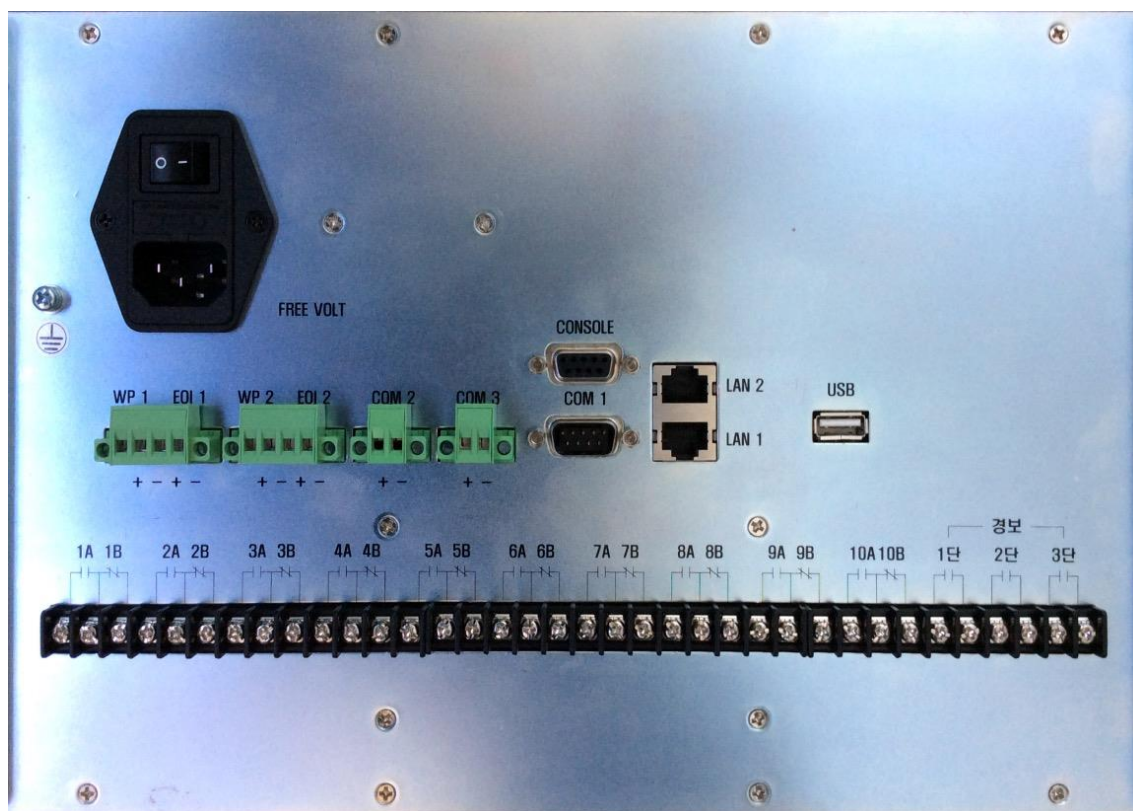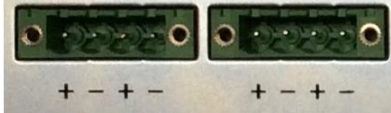
① Power input and Power switch

| Items | Description |
|---|---|
|  | Power input range is AC 90~240V, and switch turns power of main body (SDC-500) ON/OFF. Make sure to connect power into customer electric system. |

Caution) Always make sure power of main body (SDC-500) as ON. When Power is OFF, it is recognized as blackout, which makes automatic control and measuring of wattage during OFF time impossible.

② Watt-hour meter interface input

| Items | Description |
|---|---|
|  | WP: Connect with watt-hour meter's measuring output socket (Dry contact)<br><br>EOI: Connect with watt-hour meter's time limit output socket (Dry contact) |

| | |
|---|---|
| | WP2/EOI2 Port is used when changing wire from main facilities to secondary facilities at customer electric system with secondary electric facilities. |

Caution) Use cable with length of less than 30m, and using WP1/EOI1 and WP2/EOI2 at the same time is impossible.

③COM1 (RS-232C)
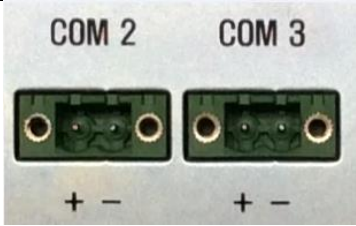
| Items | Description |
|---|---|
|  | Used when connecting Modbus slave and SMS Modem |

Caution1) Use shield cable with length of less than 15m.

Caution2) Check details of Modbus slave function in SDC-500 Function Instructions.

**<pg. 11>**

④ COM2/COM3 (RS-485)

| Items | Description |
|---|---|
|  | Used when connecting remote load control unit (LRCU-500), Samsung air conditioner, and Modbus slave. When connecting remote load control unit, connect + of main body (SDC-500) with + of remote load control unit (LRCU-500), and – of main body (SDC-500) with – of remote load control unit (LRCU-500) |

Caution 1) Slave ID of remote load control unit (LRCU-500) should be odd number between 11 and 253

Ex) 11, 13, 15, … , 253

Caution2) Check details of Modbus slave function in SDC-500 Function Instructions

⑤ CONSOLE

| Items | Description |
|---|---|
|  CONSOLE | Used for maintenance only, so normal users are not recommended to use. |

⑥ LAN1/LAN2

| Items | Description |
|---|---|
|  LAN 2 LAN 1 | We can look for monitoring, setting, log/report by connecting with SDC-500 manager.<br><br>We can get main body (SDC-500)'s data for monitoring by connecting with PLC operating with Modbus slave.<br><br>We can gang control by controlling with LG air conditioner. |

Caution) Check details of Modbus slave function in SDC-500 Function Instructions.

⑦ USB

| Items | Description |
|---|---|
|  USB | We can save report as a file with USB. |

⑧Sockets for connecting load

| Items | Description |
|---|---|
|  1A 1B | It is relay output socket which is composed for blocking load that is made due to excess of demand power more than set goal power. Number of load we can control by connecting is 10 circuits, and we can use each circuit by connecting controlling load in parallel. We can use magnetic contactor MCCB/ACP as a blocking switch to |

| | control actual load. |
| --- | --- |

⑨ Sockets for outputting alarm

| Items | Description |
| --- | --- |
|  | Relay output sockets for alarm signal which can used by connecting with outer light bar or buzzer, and emits alarm signal of 1, 2, 3. |

3. Body and manufacture size

3.1 Body size

Main body (SDC-500) Size : 340(W) X 240(H) X 146(D)
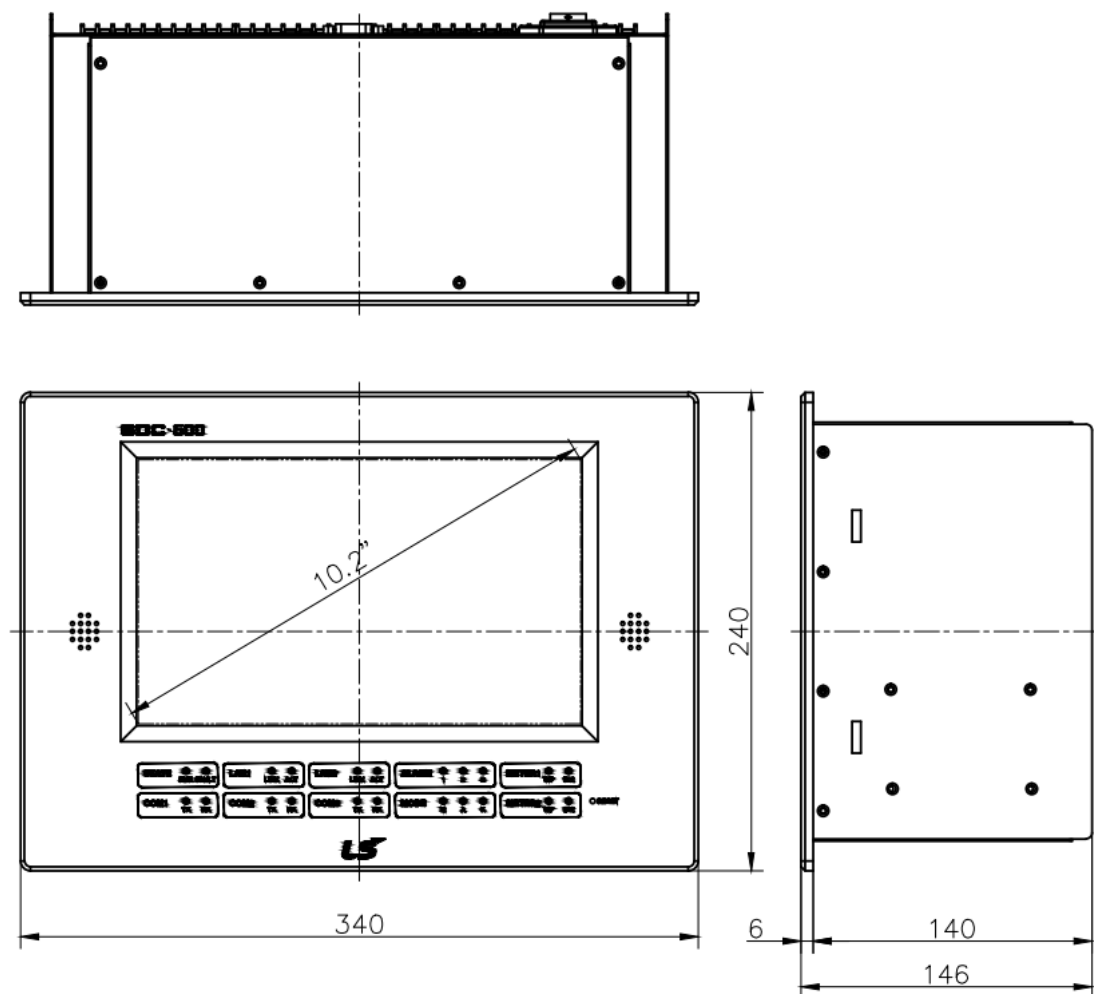
3.2 Attachment manufacture size
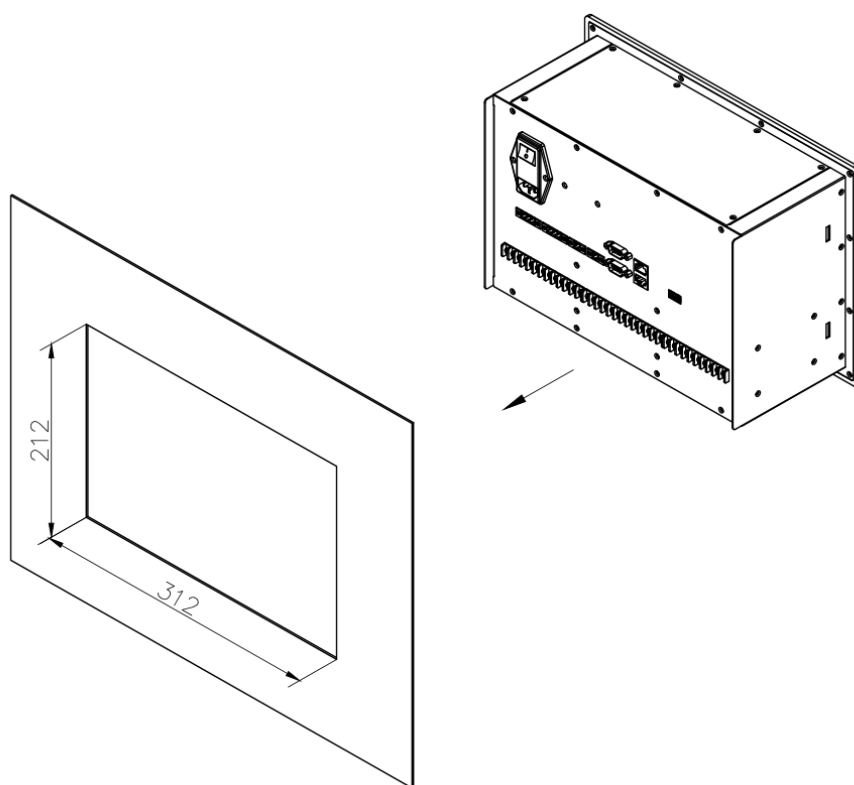
① Put attachment to width of 312mm and length of 212mm-cut panel
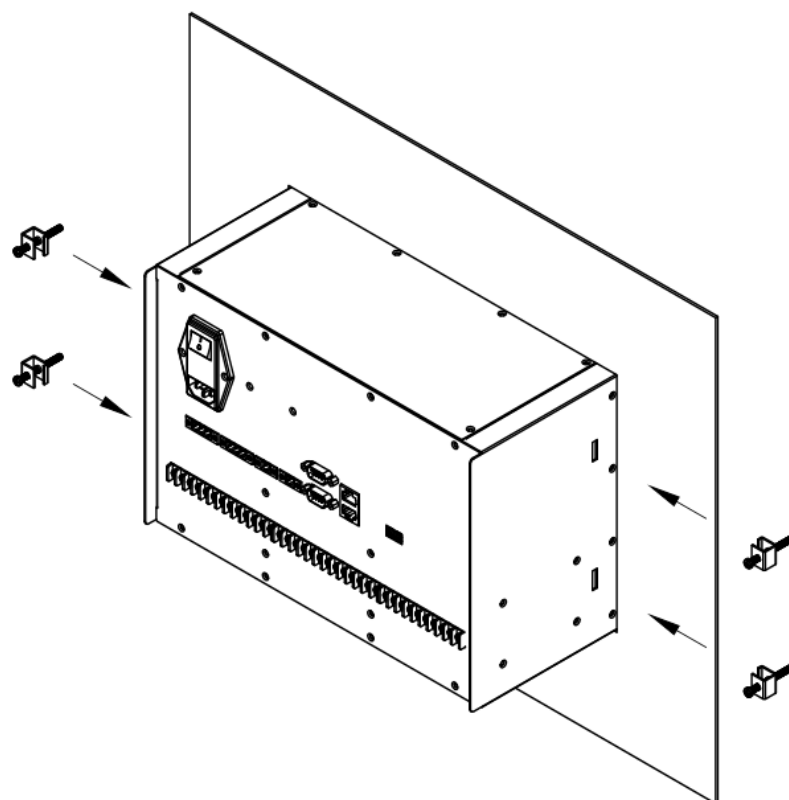
② Put fixed bracket into square hole of main body (SDC-500)'s side.
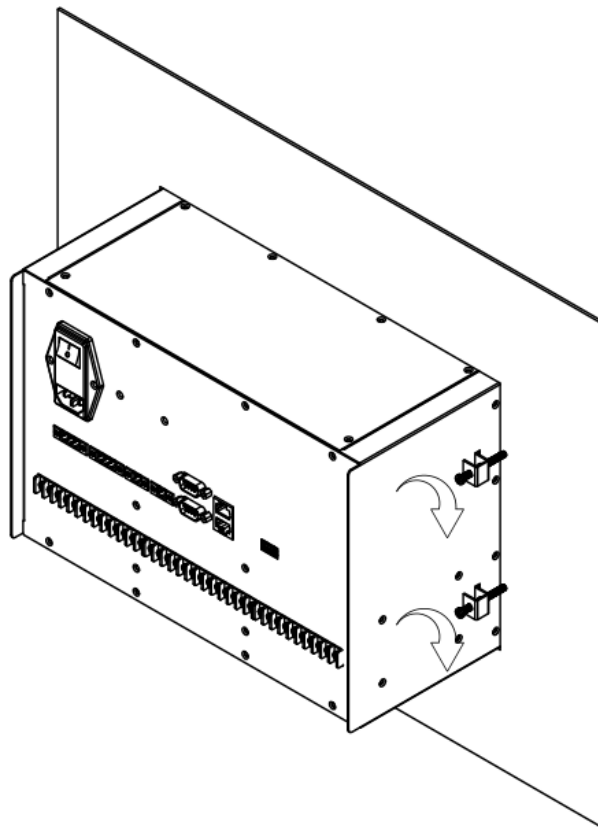
③ fasten fixed bracket screw with screwdriver.

4. Outline of maximum demand power controller

Recently, as industry develops, electricity usage increases as a trend. Power capacity should grow as electricity usage increases, but because of enormous money and time demand in expanding electricity generation and transmission facility, power supply reserve ratio reached to limit. So, government is enforcing laws which could ensure stable electric power supply by summer season maximum electricity control and securing reserve electricity. Maximum demand power controller is a device which controls customer load to sustain each customer electricity usage into within goal electricity. So, it can not only be helpful to government policy, but also brings electricity fee decrease by controlling maximum demand power of customer electricity.

In electricity fee calculation system of Korea Electricity now, fee application electricity is maximum demand power of read of that month and July, August, September of last 12 month including read month. Also, we calculate fee by separating by time and season depending on contract type.

Maximum demand power controller can set different target power seasonally, hourly, and it can control load to maintain actual power usage within pre-set target power by real-time measuring power usage and demand deadline. For example, in case of summer time, if estimated power exceeds target power due to increase of air-conditioning system's excessive electricity use, controller automatically cuts off the customer's load and decreases usage of demand power and inserts load when estimated power decreases less than demand power or when the demand deadline is terminated. Also, demand power usage can be controlled seasonally and hourly, reducing electric charges.

5. Operation Functions of maximum demand power controller
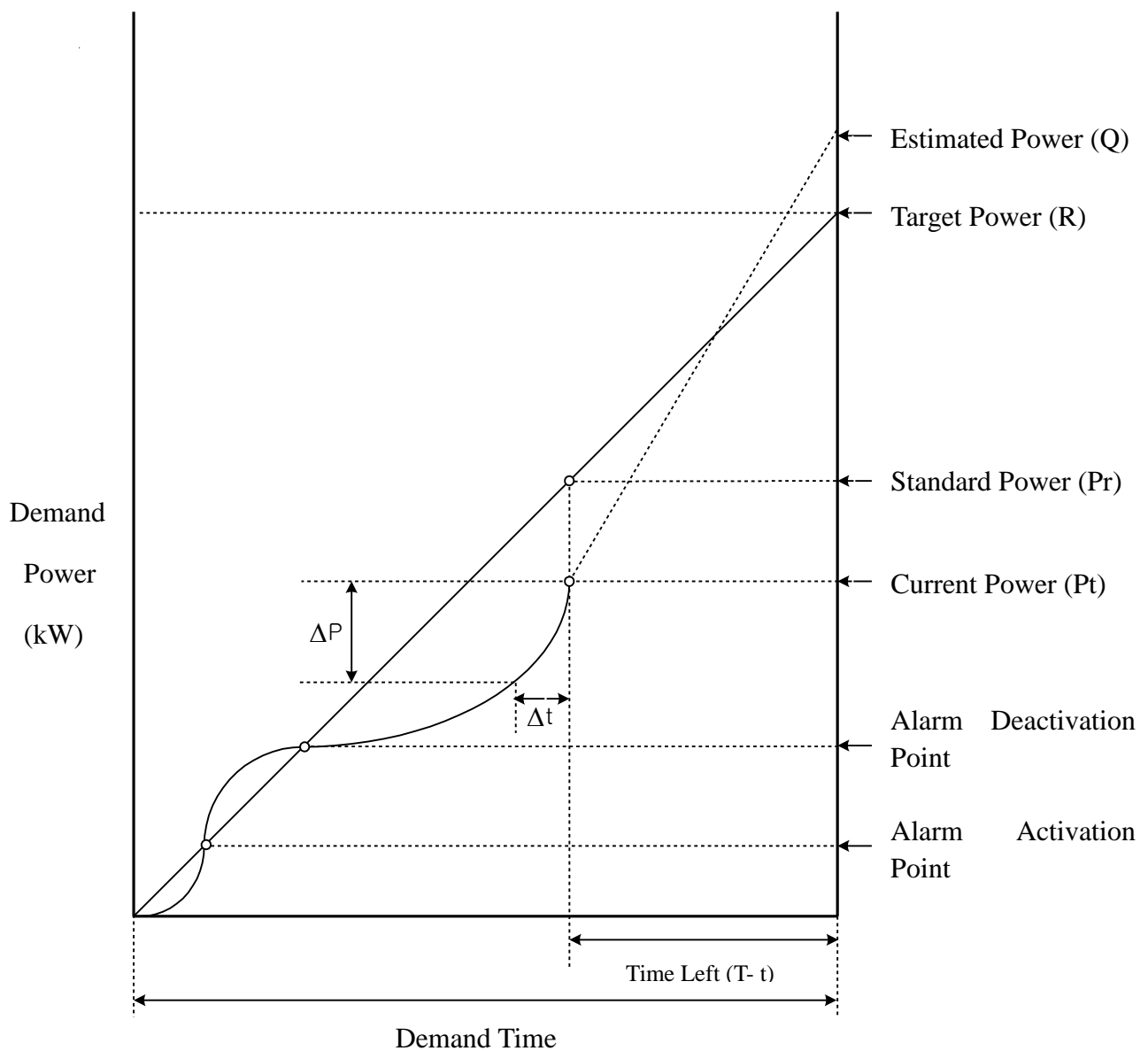
1) Calculates the current power Pt (Wattage used since the beginning of demand time) by computing the number pulses being inputted by the pulse generator.

2) Compares the current power Pt and standard power Pr (The ideal wattage usage until present time) and activates first level alarm if Pt≥ Pr.

3) Calculates estimated power Q using current power Pt, standard power Pr, and remaining demand time.

4) Calculates modified power U using estimated power Q, target power Pr, and remaining demand time.

5) Controls load according to the pre-set method arranged by relationship between modified power U, current power Pt, and standard power Pr.

Each power functions measured by the main body (SDC-500) is as below.

Current Power (Pt) = Synthetic Parameter Ratio/Pulse Integer X Intgrated Pulse Number X 60/Demand Time(Minute)

Estimated Power (Q) = Current Power + Power Variation per Unit Time/Unit Time(Minute) X Remaining Demand Time(Minute)

Standard Power (Pr) = Target Power/Remaining Demand Time(seconds) X Elapse Time(Seconds)

Modified Power (U) = (Estimated Power – Target Power)/Remaining Demand Time(minutes) X Demand Time(minutes)

6. System arrangement plan
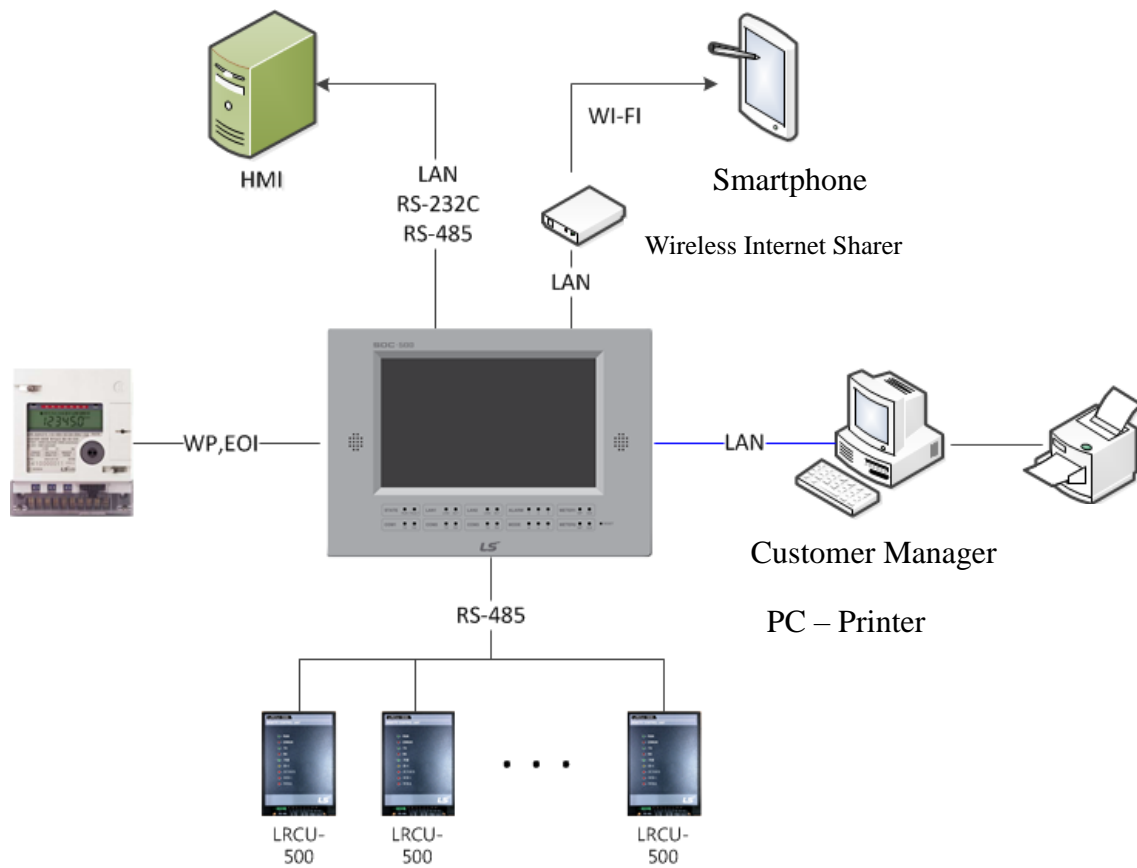
System arrangements

① Automatically controls load for demand power does not exceed target power by calculating demand power calculation and estimated power calculation from electronic watt-hour meter's measurement pulse input.

② For the maximum demand power controller to control distant load, it uses remote load control unit with RS-485.

③ Using the SDC-500 Manager program, customer's manager can do remote observations or control the main body (SDC-500) and remote load control unit (LRCU-500).

④ Measures customer's electricity consumptions and outputs pulse signal proportional to the electricity consumption. Also, outputs pulse signals when it is past demand time deadline.

⑤ Uses Modbus protocol communication to remote control or monitoring the main body (SDC-500) and remote load control unit (LRCU-500).

⑥ Uses Ethernet communication remote control or monitoring the main body (SDC-500) and remote load control unit (LRCU-500).


## 7. Product Features and Specifications

### 7.1 Product Features

#### 7.1.1 Main Body (SDC-500) Program Upgrade

It is a firmware upgrade function in SDC-500, using Ethernet to upgrade the main body's (SDC-500) program.

#### 7.1.2 Modbus Protocol Communication Function

Main body's (SDC-500) data monitoring is possible through Modbus protocol communication.

#### 7.1.3 Ethernet Communication

Ethernet communication port is built in the main body (SDC-500), enabling management of the main body (SDC-500) and remote load control unit (LRCU-500) using TCP/IP in remote servers.

#### 7.1.4 Group Control Function

Group control function for managing load in groups based on their characteristics is available.

#### 7.1.5 Seasonal Editing Function

User can edit seasons based on the Korea Electricity fee system.

#### 7.1.6 Holiday Editing Function

Set (edit) holidays, excluding Sundays, to classify holidays and weekdays and set different target powers for holidays and weekdays to control customer's power usage.

#### 7.1.7 Time Slot Editing Function

User can edit time slot based on the Korea Electricity fee system.

#### 7.1.8 Demand Power Report

Using daily, monthly, and annual functions, user can analyze customer's power usage patterns and maximum power progress.

7.1.9 Log

Using alarm, control, setting value change, system, and reset functions, user can query logs occurred during demand power management.

| Items | | Description |
|---|---|---|
| Control Power | | AC 90~ 240V, 60Hz |
| Power Consumption | | Below 15W |
| Size | | 340 (W) x 240 (H) x 146 (D) |
| Weight | | 4.8kg |
| Installation Method | | Panel Attachment Type |
| Service Environment | | Temperature Range: -10~ +50 ℃<br><br>Humidity Range: Within 90% RH<br><br>Altitude: Within 1000m above sea level |
| Display (MMI) | LCD | 10.2 inch 800x480 Graphic LCD |
| | LED | Displays system condition and communication condition |
| Input Contact Point | WP (Dry contact) 2Ch | Input measurement pulse signal |
| | E01 (Dry contact) 2Ch | Input time deadline pulse signal |
| Output Contact Point | Alarm (A contact point) | 3EA, 10A 220V AC |
| | Load Control (C contact point) | 10EA, 10A 220V AC |
| Communication Port | COM1 (RS-232C) | Connects SMS modem, Modbus slave function |
| | COM2/3 (RS-485) | Connects remote load control unit (LRCU- |

| | | 500) |
| --- | --- | --- |
| | | Samsung air conditioning, Modbus slave function |
| | Ethernet (10/100 Base-T) | Connects SDC-500 Manager, LG air conditioning, Modbus slave function |
| | USB | Saves report |

## 8. Features Description

### 8.1 Basic Handling Method

### 8.1.1 Changing Setting Values

Tab "Set-up" button in the initial screen to find the display like below. In the current conditions, user can only check the settings and if the user wants to change the settings, user must switch to write mode.
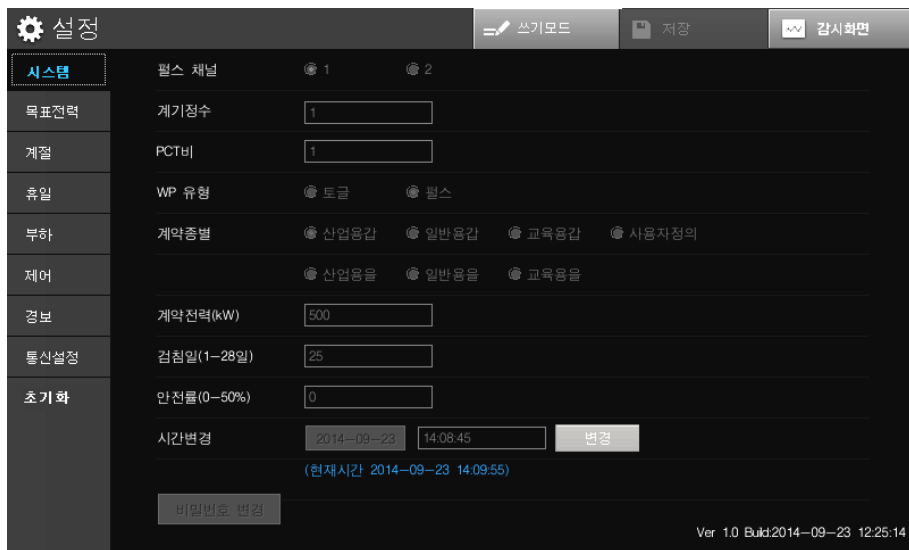


[LCD screen] Settings Screen

When the user tabs write mode, the following dialog appears. Type in the password and tab ENTER button to activate write mode. The initial password is '0000'.
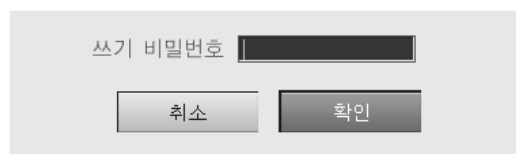
[LCD screen] Enter password

When finished typing in the password, tab ENTER to deactivate write mode button like the image below and activates settings input boxes.



[LCD screen] Screen with activated setting input
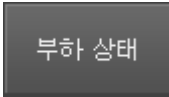
If the user wants to finish or cancel, tab monitoring screen button to find the changed settings, or if changes are not saved, a message appears like the image below. If the user saves, the main program of the main body (SDC-500) may reboot depending on the changed settings.
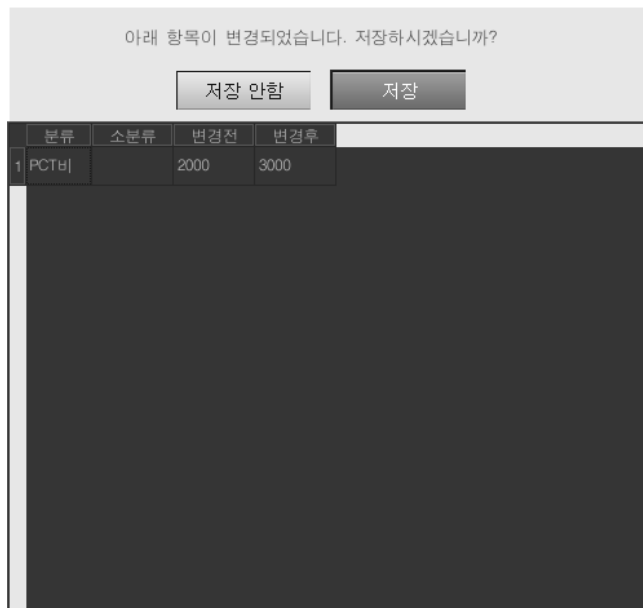
[LCD screen] Confirming the changed settings

8.2 Menu Components

Main body's (SDC-500) initial screen menu is composed as the table below.

| Items | Description |
|---|---|
| Settings <br>  | Change necessary settings for demand power management |
| Logs/Reports <br>  | Query logs and query/save reports |
| Load Conditions <br>  | Check and control main body's (SDC-500) load and remote load control unit's condition, in case of a linked air conditioning, user can check and control load conditions |

[LCD screen] Main screen menu components

Descriptions on menus shown on log/report screen and setting screen.

| Items | Description |
|---|---|
| Monitoring Screen<br><br>[감시화면 button] | Can move from setting, log/report menu to initial (monitoring) screen |

[LCD screen] Log/report/settings menu components


8.3 Operation and Settings

8.3.1 Monitoring

Monitoring screen displays target power, standard power, demand time deadline, time information like the figure below.
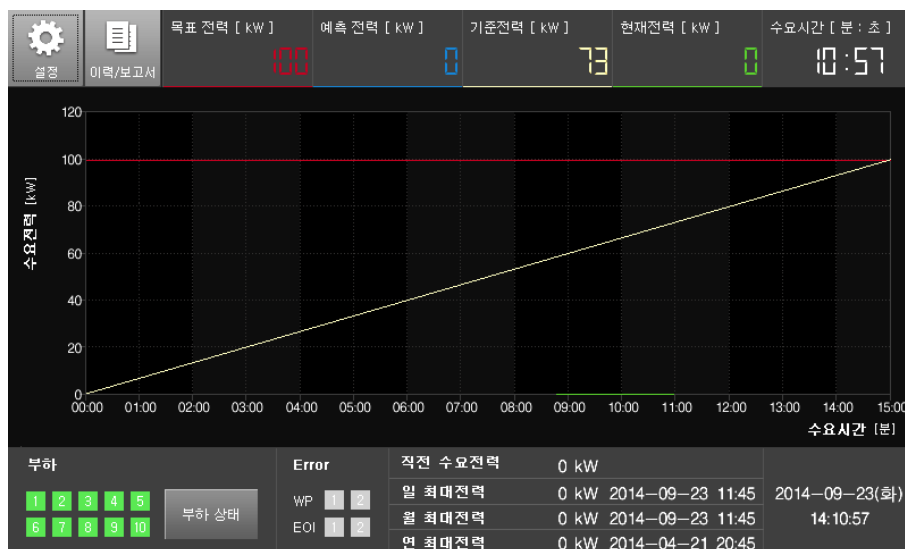


[LCD screen] Initial Screen

| Items | Description |
|---|---|
| Target Power | Displays target power pre-set on the load time slot corresponding to current date/time |
| Estimated Power | Displays estimated power after passing demand time deadline |
| Standard Power | Displays target power corresponding to the |

| | |
|---|---|
| | time deadline |
| Current Power | Displays used demand power until current time |
| Demand Time | Displays progressed demand time deadline |
| Load Condition | Displays load conditions <br><br> | LED Color | Description | <br> |---|---| <br> | Green | Load input status | <br> | Red | Load cut-off status | <br> | Grey | Not in use or unknown status | |
| WP Error | When grey, a normal state when WP signal is inputted |
| | When red, WP signal has not been inputted once for a designated time (930 seconds) |
| E01 Error | When grey, a normal state when E01 signal is inputted |
| | When red, E01 signal has not been inputted once for a designated time (960 seconds) |
| Previous Demand Power | Displays power usage right before demand time deadline |
| Daily Maximum Power | Displays the maximum wattage time and its value during the day |
| Monthly Maximum Power | Displays the maximum wattage time and its value during the month |
| Annual Maximum Power | Displays the maximum wattage time and its value during the year |
| Time | Displays the system time synchronized with the watt-hour meter |

[LCD screen] Display contents

8.4 Manual Load Control

Used when the manager, discretely controls certain load through manual load control. To manually control load, the operation mode must be switched to manual condition, and the menu components are composed of individual control method and group control method like the image provided below.

| Items | Description |
|---|---|
| Individual Control | Controls only one selected load |
| Group Control | Controls load within the same group pre-set in the load register settings |
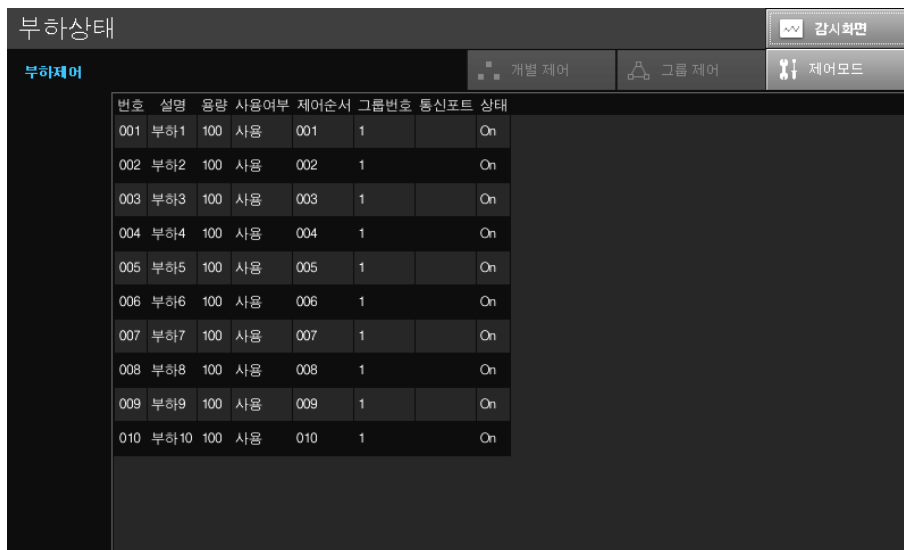


8.4.1 Individual Control

Controls load pre-set in the main body (SDC-500) individually. The image below is the individual control LCD screen.
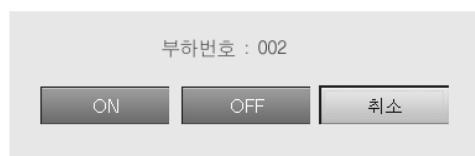
[LCD screen] Individual control

The descriptions about the above LCD screen image are in the table below.

| Items | Description |
| --- | --- |
| Load Number | Selected load number |
| ON | Inputs load control value |
| OFF | Cuts off load control value |
| Cancel | Cancels load control order |

**<pg. 24>**

8.4.2 Group Control

Controls load pre-set in the main body (SDC-500) in groups. The image below is the group control LCD screen.



[LCD screen] Group control

The descriptions about the above LCD screen image are in the table below.

| Items | Description |
| --- | --- |
| Group Number | Selected group number |
| ON | Inputs load control value |
| OFF | Cuts off load control value |
| Cancel | Cancels load control order |

Caution) When using group control, depending on the communication status with remote load control unit (LRCU-500), there may be normally uncontrollable load.

8.5 Settings

The settings menu is composed as the image below. Detailed descriptions of each menu are described below.

8.5.1 System



8.5.1.1 Pulse Channel

Defines input measurement and time deadline pulse channel

Default value is set to channel 1, and when pulse channel 1 is selected, it uses WP1 and E0|1 port behind the main body (SDC-500) to connect watt-hour meter's measurement/ time deadline pulse output line. When channel 2 is selected, it uses WP2 and E01|2 port behind the main body (SDC-500) to connect watt-hour meter's measurement/ time deadline pulse output line.

**<pg. 25>**

8.5.1.2 Calibrating Constant

It is watt-hour meter's pulse number per kWh (pulse/kWh), and it is normally indicated in front, having the setting value span of 1~ 1,000,000.

Caution) If pulse constant is set in a different value from watt-hour meter, demand watt-hour calculation will be incorrect, so correct pulse constant input is recommended.

8.5.1.3 PCT Ratio

PCT ratio is multiplication of connected PT and CT ratio, and the value can be set in the

range of 1~ 999,999.

For example, when watt-hour meter's PT ratio is 154000/110, CT ratio is 20/5, and connected, PCT ratio is set to 1400 (PT ratio) x 4 (CT ratio) = 5600.

### 8.5.1.4 WP Type

This means the type of output from measurement pulse in the watt-hour meter, and one type can be selected between toggle/pulse.

The following is the waveform of the corresponding types.

| Items | Description |
|---|---|
| Toggle | |
| Pulse | |

### 8.5.1.5 Contract Type

It is organized in electricity supply terms "Chapter 7 Various Contract Types"order and the using values of the main body's (SDC-500) is defined in the table below.

| Settings Value | Description |
|---|---|
| Industrial Purpose A | Applied to customers using power, above 4kW and below 300kW of the contract power, in mining, manufacturing and other businesses. |
| Industrial Purpose B | Applied to customers using power, above 4kW and below 300kW of the contract power, in mining, manufacturing and other businesses. |
| General Purpose A | Applied to customers using power, below 300kW of the contract power, excluding other classifications. |
| General Purpose B | Applied to customers using power, above 300kW of the contract power, excluding other classifications. |

| Educational Purpose A | Applied to school related educational facilities (affiliated hospitals excluded) recognized by the law, libraries and libraries according to the reading promotion law, museums and art museums according to museums promotion law, science museums according to science museum promotion law, and customers with contract power below 1000kW. |
|---|---|
| Educational Purpose B | Applied to school related educational facilities (affiliated hospitals excluded) recognized by the law, libraries and libraries according to the reading promotion law, museums and art museums according to museums promotion law, science museums according to science museum promotion law, and customers with contract power above 1000kW. |
| User Defined | Control during the user's designated time. |

## 8.5.1.6 Contract Power

It means the service capacity contracted with Korea Electricity, and the value can be set to 1~ 1,000,000.

It is irrelevant to demand power management and is used only for reference.

## 8.5.1.7 Reading Date

It is Korea Electricity's watt-hour meter reading date, and the value can be set between 1~ 28.

It is irrelevant to demand power management and is used only for reference.

## 8.5.1.8 Safety Ratio

Due to abrupt load change and other reasons, power usage may exceed target power. To prevent this problem and for thorough target power management, safety ratio is used to control actual power below the value of the target power.

The value can be set in the range of 0~ 50.

For example, by setting the target power value to 1000kW and setting safety ratio to 5%, actual controlled target power is 950kW.

Caution) If safety ratio is set to 0, it means the safety ration function is inactive.

8.5.1.9 Time Change

The main body (SDC-500) is linked with watt-hour meter and time deadline pulse to control customer's maximum demand power using measured demand power and saves logs/reports. So, the time must be accurately input when installing the product.

Caution) If watt-hour meter is not linked, the saved demand power logs/reports are not saved correctly and cases of uncontrollable maximum demand power may occur.

8.5.1.10 Changing Password

4-digit password can be set to prevent users other than the manager to see the setting values and change the settings. The default password (when the product is shipped) is "1234", and writing password is "0000".

Types of password are described in the table below.

| Items | Setting Values | Description |
|---|---|---|
| Reading Password | More than 4-digits ~ Less than 12-digits | Log-in password for monitoring purpose |
| Writing Password | More than 4-digits ~ Less than 12-digits | Password to change settings and load control |

8.5.2 Setting Target Power

It is target quantity of control power depending on the customer's demand power consumption conditions and controllable load capacity. Details of each menu are described below.

Target power settings are organized in weekdays and holidays detailed menus like the image below.Also, it is organized seasonally for light-load, middle-load, heavy-load time slots.

The table below is the default settings.

| Classification | Summer, Spring, Fall Seasons | Winter Season |
|---|---|---|

|  | (June~ August), (March~ May, September~ October) | (November~ February) |
|---|---|---|
| Light-load Time Slot | 23:00~09:00 | 23:00~09:00 |
| Middle-load Time Slot | 09:00~10:00 | 09:00~10:00 |
| | 12:00~13:00 | 12:00~17:00 |
| | 17:00~23:00 | 20:00~22:00 |
| Maximum-load Time Slot | 10:00~12:00 | 10:00~12:00 |
| | 13:00~17:00 | 17:00~20:00 |
| | | 22:00~23:00 |

Also, using the mass registration button, identical target power value can be set regardless of season time slots.

Caution) When installing, target power for all seasons and time slots should adjusted to the customer's situations.

8.5.3 Seasons

Seasons can be set based on the Korea Electricity fee system.

8.5.4 Holidays

Holidays mean Thanksgiving, New Year holidays and other holidays including special holidays such as Election Day. (Excluding Sundays)

8.5.4.1 Examining Holidays List

It is to check the contents of pre-set holidays.
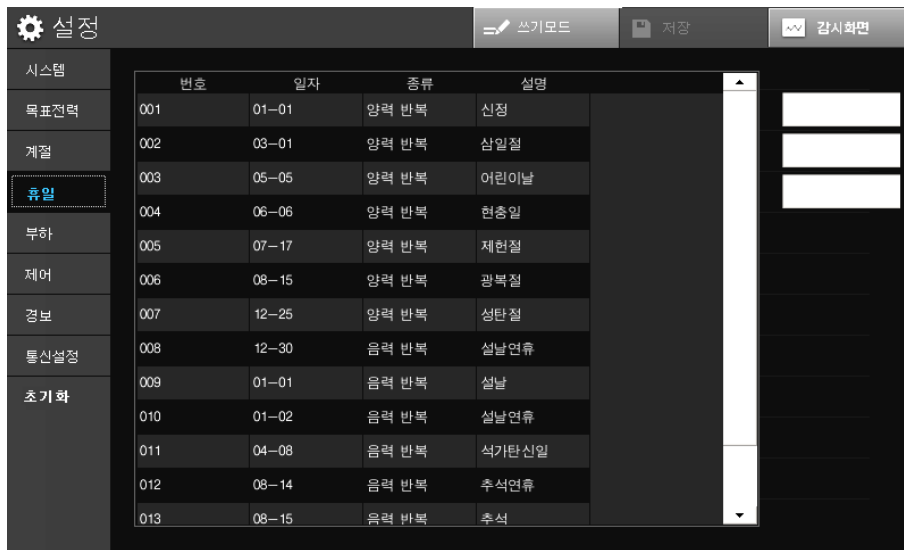
## 8.5.4.2 Addition of Holidays

To add in new holidays, tab Add button and select the type in the box shown in the image below and select the date then tab Ok.



| Types | Description |
|---|---|
| Repetition of Solar Calendar | Select when adding annual holidays in solar calendar. |
| Repetition of Lunar Calendar | Select when adding annual holidays in lunar calendar. |
| One-time of Solar Calendar | Select when adding a holiday in a certain solar calendar year. |
| One-time of Lunar Calendar | Select when adding a holiday in a certain lunar calendar year. |

## 8.5.4.3 Editing Holidays

Editing holidays is a menu when the pre-set holiday date is changed or mis-typed.

To change (edit) holidays, select the changing item in the list and tab Edit button, then change the type and date of the holiday and tab Ok.

8.5.5 Loads

Manages used loads when controlling load. Details of each menu are described below.



| Items | Description |
|---|---|
| Number | Including the main body's (SDC-500) 10 loads and remote load control unit's (LRCU-500) load, numbers can be managed up to 256 numbers, and remote load control unit's (LRCU-500) communication ID coincides with load number. |
| Description | Type in simple descriptions of the load. (Only edited in SDC-500 Manager.) |
| Capacity* | Type in the capacity of connected load. |
| Availability | Sets availability of load control. |

| | Setting Values | Description |
|---|---|---|
| | In Use | Means the load control is in use, and the default values are all pre-set to "In use" |

| | |
|---|---|
| | state |
| | Not In Use | Means the load control is not in use, and manual/automatic control is not possible. |
| Control Order | Order of load control |
| Group Number | Group settings can set groups of loads connected to main body (SDC-500) and remote load control unit (LRCU-500), also simultaneously control included loads.<br><br>Load groups can be comprised of maximum 10 loads. |
| Communication Port | Using remote load control unit (LRCU-500) is possible when RCU is selected in the COM2, COM3 (RS-485) items in "Communication Settings" menu. |

### 8.5.5.1 Editing Loads

Editing load option is used when settings are changed or mis-typed. To edit loads, select the changing load in the list and tab Edit button, then change the value and tab Ok.

### 8.5.5.2 Deleting Loads

Deleting load option is used when settings ar changed or mis-typed. To delete load, select the deleting load and tab Delete button.

### 8.5.6 Control

Load control settings menu is comprised of setting values for controlling loads. The details of settings are described below.
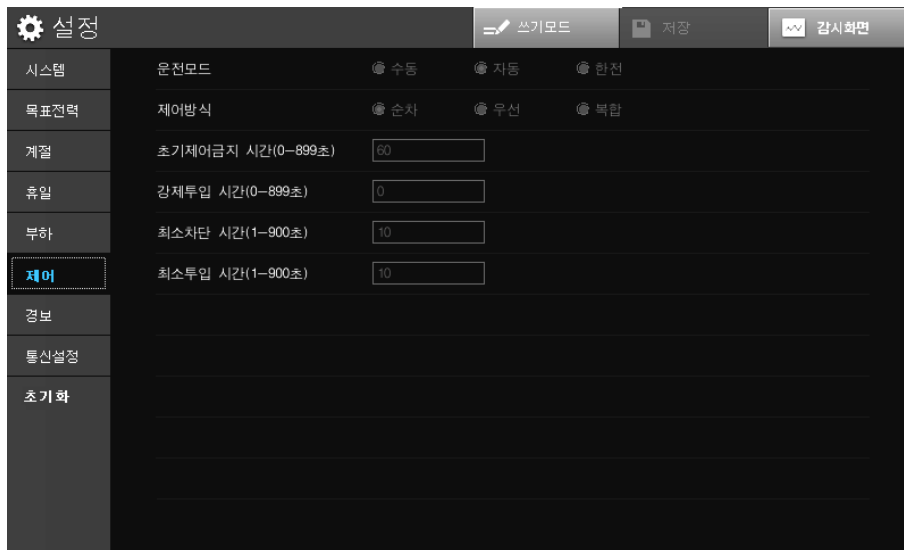
## 8.5.6.1 Operation Mode

| Setting Values | Description |
|---|---|
| Manual | It means manual control mode and it does not automatically control loads even if the demand power exceeds target power. When exceeds target power, only first stage alarm is activated. User must directly control loads (individual/group), so that the demand power does not exceed target power. |
| Automatic | It means automatic control mode and automatically controls loads, so that the demand power does not exceed the target power. |

Caution) If it is in manual mode, load cannot be controlled automatically and the demand power may exceed target power.

## 8.5.6.2. Control Method

Depending on the settings, the sequence of load controlled during load cutoff/ input activates differently. The load control methods depending on the settings are described below.

| Settings Value | Description. |
|---|---|
| Sequential | Control method that cuts off load in numerical order without repetition and restores in numerical order without repetition |

| Priority | Control method that cuts off load in numerical order and restores in reverse numerical order |
|---|---|
| Complex | Control method that cuts off load in numerical order without repetition and restores in order of recent cut off order |

The table below explains the cut-off/closing operation depending on the settings when controlling maximum demand power using 10 loads. (0: Load is closed, X: Load is cut-off)

1) Sequential Control

| Control Condition | Load Number | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Default Condition (Initial) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cut-off | X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cut-off | X | X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Close (Input) | 0 | X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cut-off | 0 | X | X | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cut-off | 0 | X | X | X | 0 | 0 | 0 | 0 | 0 | 0 |
| Cut-off | 0 | X | X | X | X | 0 | 0 | 0 | 0 | 0 |
| Close (Input) | 0 | 0 | X | X | X | 0 | 0 | 0 | 0 | 0 |
| Close (Input) | 0 | 0 | 0 | X | X | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cut-off | 0 | 0 | 0 | X | X | X | 0 | 0 | 0 | 0 |
| Close (Input) | 0 | 0 | 0 | 0 | X | X | 0 | 0 | 0 | 0 |
| Close (Input) | 0 | 0 | 0 | 0 | 0 | X | 0 | 0 | 0 | 0 |
| Close (Input) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cut-off | 0 | 0 | 0 | 0 | 0 | 0 | X | 0 | 0 | 0 |
| Cut-off | 0 | 0 | 0 | 0 | 0 | 0 | X | X | 0 | 0 |
| Close (Input) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X | 0 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cut-off | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X | X | 0 |
| Cut-off | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X | X | X |
| Cut-off | X | 0 | 0 | 0 | 0 | 0 | 0 | X | X | X |
| Cut-off | X | X | 0 | 0 | 0 | 0 | 0 | X | X | X |
| Cut-off | X | X | X | 0 | 0 | 0 | 0 | X | X | X |
| Close (Input) | X | X | X | 0 | 0 | 0 | 0 | 0 | X | X |
| Close (Input) | X | X | X | 0 | 0 | 0 | 0 | 0 | 0 | X |
| Close (Input) | X | X | X | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Close (Input) | O | X | X | O | O | O | O | O | O | O |
| Cut-off | O | X | X | X | O | O | O | O | O | O |
| Close (Input) | O | O | X | X | O | O | O | O | O | O |
| Cut-off | O | O | X | X | X | O | O | O | O | O |
| Cut-off | O | O | X | X | X | X | O | O | O | O |
| Cut-off | O | O | X | X | X | X | X | O | O | O |
| Cut-off | O | O | X | X | X | X | X | X | O | O |
| Cut-off | O | O | X | X | X | X | X | X | X | O |
| Cut-off | O | O | X | X | X | X | X | X | X | X |
| Cut-off | X | O | X | X | X | X | X | X | X | X |
| Cut-off | X | X | X | X | X | X | X | X | X | X |
| Close (Input) | X | X | O | X | X | X | X | X | X | X |
| Close (Input) | X | X | O | O | X | X | X | X | X | X |
| Close (Input) | X | X | O | O | O | X | X | X | X | X |
| Close (Input) | X | X | O | O | O | O | X | X | X | X |
| Close (Input) | X | X | O | O | O | O | O | X | X | X |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Close (Input) | X | X | O | O | O | O | O | O | X | X |
| Close (Input) | X | X | O | O | O | O | O | O | O | X |
| Close (Input) | X | X | O | O | O | O | O | O | O | O |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Close (Input) | O | X | O | O | O | O | O | O | O | O |
| Close (Input) | O | O | O | O | O | O | O | O | O | O |

## 2) Priority Control

| Control Conditions | Load Number | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Default Condition (Initial) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cut-off | X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cut-off | X | X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Close (Input) | X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cut-off | X | X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cut-off | X | X | X | O | O | O | O | O | O | O |
| Cut-off | X | X | X | X | O | O | O | O | O | O |
| Close (Input) | X | X | X | O | O | O | O | O | O | O |
| Close (Input) | X | X | O | O | O | O | O | O | O | O |
| Cut-off | X | X | X | O | O | O | O | O | O | O |
| Close (Input) | X | X | O | O | O | O | O | O | O | O |
| Close (Input) | X | O | O | O | O | O | O | O | O | O |
| Close (Input) | O | O | O | O | O | O | O | O | O | O |
| Cut-off | X | O | O | O | O | O | O | O | O | O |
| Cut-off | X | X | O | O | O | O | O | O | O | O |
| Close (Input) | X | O | O | O | O | O | O | O | O | O |
| Cut-off | X | X | O | O | O | O | O | O | O | O |
| Cut-off | X | X | X | O | O | O | O | O | O | O |
| Cut-off | X | X | X | X | O | O | O | O | O | O |
| Cut-off | X | X | X | X | X | O | O | O | O | O |
| Cut-off | X | X | X | X | X | X | O | O | O | O |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Close (Input) | X | X | X | X | X | O | O | O | O | O |
| Close (Input) | X | X | X | X | O | O | O | O | O | O |
| Close (Input) | X | X | X | O | O | O | O | O | O | O |
| Close (Input) | X | X | O | O | O | O | O | O | O | O |
| Cut-off | X | X | X | O | O | O | O | O | O | O |
| Close (Input) | X | X | O | O | O | O | O | O | O | O |
| Cut-off | X | X | X | O | O | O | O | O | O | O |
| Cut-off | X | X | X | X | O | O | O | O | O | O |
| Cut-off | X | X | X | X | X | O | O | O | O | O |
| Cut-off | X | X | X | X | X | X | O | O | O | O |
| Cut-off | X | X | X | X | X | X | X | O | O | O |
| Cut-off | X | X | X | X | X | X | X | X | O | O |
| Cut-off | X | X | X | X | X | X | X | X | X | O |
| Cut-off | X | X | X | X | X | X | X | X | X | X |
| Close (Input) | X | X | X | X | X | X | X | X | X | O |
| Close (Input) | X | X | X | X | X | X | X | X | O | O |

| Close (Input) | X | X | X | X | X | X | X | O | O | O |
|---|---|---|---|---|---|---|---|---|---|---|
| Close (Input) | X | X | X | X | X | X | O | O | O | O |
| Close (Input) | X | X | X | X | X | O | O | O | O | O |
| Close (Input) | X | X | X | X | O | O | O | O | O | O |
| Close (Input) | X | X | X | O | O | O | O | O | O | O |
| Close (Input) | X | X | O | O | O | O | O | O | O | O |
| Close (Input) | X | O | O | O | O | O | O | O | O | O |
| Close (Input) | O | O | O | O | O | O | O | O | O | O |

### 3) Complex Control

| Control Condition | Load Number | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Default Condition (Initial) | O | O | O | O | O | O | O | O | O | O |
| Cut-off | X | O | O | O | O | O | O | O | O | O |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cut-off | X | X | O | O | O | O | O | O | O | O |
| Close (Input) | X | O | O | O | O | O | O | O | O | O |
| Cut-off | X | O | X | O | O | O | O | O | O | O |
| Cut-off | X | O | X | X | O | O | O | O | O | O |
| Cut-off | X | O | X | X | X | O | O | O | O | O |
| Close (Input) | X | O | X | X | O | O | O | O | O | O |
| Close (Input) | X | O | X | O | O | O | O | O | O | O |
| Cut-off | X | O | X | O | O | X | O | O | O | O |
| Close (Input) | X | O | X | O | O | O | O | O | O | O |
| Close (Input) | X | O | O | O | O | O | O | O | O | O |
| Close (Input) | O | O | O | O | O | O | O | O | O | O |
| Cut-off | O | O | O | O | O | O | X | O | O | O |
| Cut-off | O | O | O | O | O | O | X | X | O | O |
| Close (Input) | O | O | O | O | O | O | X | O | O | O |
| Cut-off | O | O | O | O | O | O | X | O | X | O |
| Cut-off | O | O | O | O | O | O | X | O | X | X |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Cut-off | X | O | O | O | O | O | X | O | X | X |
| Cut-off | X | X | O | O | O | O | X | O | X | X |
| Cut-off | X | X | X | O | O | O | X | O | X | X |
| Close (Input) | X | X | X | O | O | O | X | O | X | O |
| Close (Input) | X | X | X | O | O | O | X | O | O | O |
| Close (Input) | X | X | X | O | O | O | O | O | O | O |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Close (Input) | X | X | O | O | O | O | O | O | O | O |
| Cut-off | X | X | O | X | O | O | O | O | O | O |
| Close (Input) | X | X | O | O | O | O | O | O | O | O |
| Cut-off | X | X | O | O | X | O | O | O | O | O |
| Cut-off | X | X | O | O | X | X | O | O | O | O |
| Cut-off | X | X | O | O | X | X | X | O | O | O |
| Cut-off | X | X | O | O | X | X | X | X | O | O |
| Cut-off | X | X | O | O | X | X | X | X | X | O |
| Cut-off | X | X | O | O | X | X | X | X | X | X |
| Cut-off | X | X | X | O | X | X | X | X | X | X |

| Cut-off | X | X | X | X | X | X | X | X | X | X |
|---|---|---|---|---|---|---|---|---|---|---|
| Close (Input) | X | X | X | X | X | X | X | X | X | 0 |
| Close (Input) | X | X | X | X | X | X | X | X | 0 | 0 |
| Close (Input) | X | X | X | X | X | X | X | 0 | 0 | 0 |
| Close (Input) | X | X | X | X | X | X | 0 | 0 | 0 | 0 |
| Close (Input) | X | X | X | X | X | 0 | 0 | 0 | 0 | 0 |
| Close (Input) | X | X | X | X | 0 | 0 | 0 | 0 | 0 | 0 |
| Close (Input) | X | X | X | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Close (Input) | X | X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Close (Input) | X | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Close (Input) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

8.5.6.3 Initial Control Prohibited Time

After demand time deadline, initial control prohibited time setting is to prevent excessive load control by not cutting off the load within the pre-set time limit even under load control conditions. The settings range is 0~ 899 seconds.

For example, if the initial control prohibited time is set to 60 seconds, the load is not cut off even under load control conditions within 60 seconds of demand time deadline at automatic mode.

## 8.5.6.4 Coercive Input Time

During demand power management situations, the setting coercively inputs load after pre-set time under cut off conditions after load cut off.

The settings range is 0~ 899 seconds.

## 8.5.6.5 Minimum Cut Off Time

During demand power management situations, the setting cuts off the load if the load's cut off conditions continue during the pre-set time.

The settings range is 1~ 900 seconds.

## 8.5.6.6 Minimum Input Time

During demand power management situations, the setting inputs load if the load's input conditions continue during the pre-set time.

The settings range is 1~ 900 seconds.

## 8.5.7 Alarm Settings

Alarms the user of the main body's (SDC-500) load control conditions or load cut off status at the back of the main body's (SDC-500) alarm contact or through alarm sound.

The alarm setting menu is organized as below. (Figure) Details of each menus will be described below.

The basic method of alarm setting is through checking the boxes; check(V) sign in the box means activating the sound/ contact alarm and no check(  ) sign in the box means deactivating the alarm.
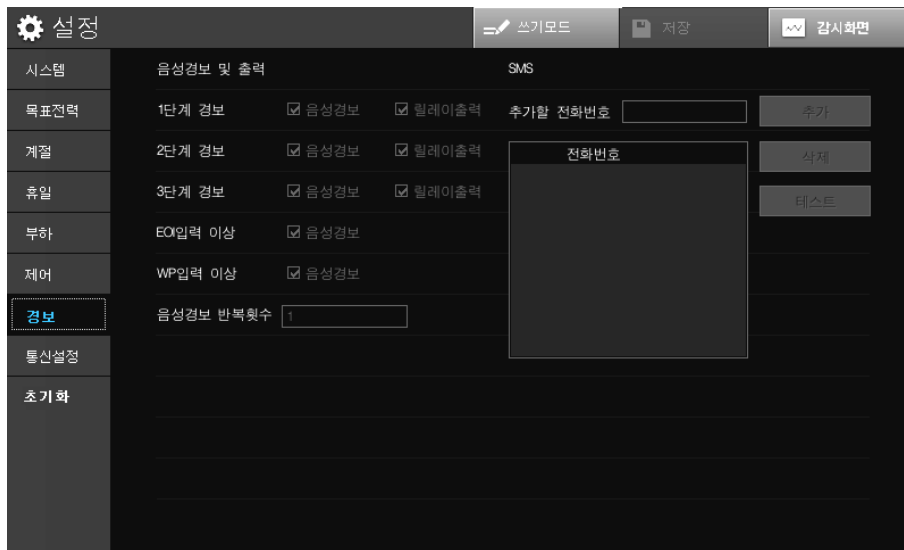
8.5.7.1 Primary, Secondary, Tertiary Alarm

| Items | Description |
|---|---|
| Primary Alarm | If 'Current Power ≥ Standard Power' or 'Estimated Power ≥ Target Power', primary alarm contact is closed (output). |
| Secondary Alarm | If more than one load is cut off, secondary alarm is closed (output). |
| Tertiary Alarm | If all of the loads set in the main body (SDC-500) and Remote Load Control Unit (LRCU-500) are cut off, tertiary alarm is closed (output). |

Caution) If there is no check sign in the alarm setting box, there will be no alarm output even under alarm settings.

8.5.7.2 EOI Input Abnormality

If there is no time deadline pulse of watt-hour meter for 960 seconds, sound alarm activates corresponding to the settings.

8.5.7.3 WP Input Abnormality

If there is no measurement limit pulse of watt-hour meter for 930 seconds, sound alarm activates corresponding to the settings.

8.5.7.4 Repeat Count of Sound Alarm

Sets the repeat count of sound alarms. The settings range is 1~ 3 counts of alarms.


8.5.7.5 Adding SMS Number Function

Enter a phone number which the user wants to receive a text message in case of an alarm, and tab the ADD button.

Caution) Before setting SMS function, user must check the SMS item in the communications setting at COM1 (RS-232C) unit list. When SMS is selected (checked), the communication speed is automatically fixed to 115200.


8.5.7.6 Deleting SMS Number Function

This function deletes the user's phone number from the receiver's list when the user does not want to receive text messages in case of an alarm. To delete phone number, select the number from the list and tab DELETE button.


8.5.7.7 Testing SMS Function

This function checks the correct activation of message sending function of an existing modem or when the modem is first installed.

To use this test function, select a phone number from the list and tab TEST button and wait for the text message received at the selected cell phone.


If failed,

1) Move to 'Communications Setting' Menu and check if the SMS is selected at COM1 (RS-232C) unit selection.

2) Check the connection between SMS modem and the main body's (SDC-500) COM1 terminal in the back.


8.5.8 Communication Settings

Communication setting menus are organized as below. (Figure) Each menu is described in detail below.



| Items | Settings Value | Default Value | Description |
|---|---|---|---|
| Unit | Not Used | Not Used | Select when not using the communication port |
| | Modbus | | Select to carry main body's (SDC-500) data from third part software such as SCADA and HMI to Modbus RTU protocol using slave function. |
| | SMS | | Select when wanting to receive alarm through SMS messages by connecting SMS modem.<br><br>Caution) SMS modem with different manufacturer, may require different functions and interfaces for text message functions. Please contact us for information or guidance before use. |

| Communication | 4800, 9600, 19200, | 9600 | Sets the communication speed being served or will be served by |

| Speed | 38400, 115200 | | the equipment.<br><br>But, when SMS is selected, it is fixed to 115200. |
|---|---|---|---|
| Parity | None, Odd, Even | None | Selects parity of the same value with the communication settings of the device being connected. |

## 8.5.8.2 COM2/3 (RS-485)

The following table is the description of setting items.

| Items | Setting Value | Default Value | Description |
|---|---|---|---|
| Unit | Not Used | Not Used | Select when not using the communication port. |
| | RCU | | Connects Remote Load control Unit (LRCU-500) to expand load control. |
| | Samsung Air Conditioning | | Select to connect Samsung system air conditioning to link load control. When setting values, select communication speed to 9600, parity to None. |
| | Modbus | | Select to carry main body's (SDC-500) data from third part software such as SCADA and HMI to Modbus RTU protocol using slave function. |
| Communication Speed | 4800, 9600, 19200, 38400, 115200 | 9600 | Sets the communication speed being served or will be served by the equipment.<br><br>But, when remote load control unit (LRCU-500) is selected, 4800 is not used. |

| Parity | None, Odd, Even | None | Sets being served or will be served parity by the equipment. |
|---|---|---|---|

### 8.5.8.3 LAN1

Used as the main communication port and used when connecting SDC-500 Manager, when main body's (SDC-500) data from third part software such as SCADA and HMI are allowed to be carried to Modbus RTU protocol using slave function, and when load controlling LG air conditioning.

| Items | Default Values |
|---|---|
| IP address | 192.168.123.50 |
| Subnet mask | 255.255.255.0 |

### 8.5.8.4 LAN2

This port is advised to use only when connecting 1:1 to other equipment or when connecting to internal networks disconnected from external internet system.

| Items | Default Value |
|---|---|
| Availability | Use |
| IP address | 10.10.10.10 |
| Subnet mask | 255.255.255.0 |

Caution) Must use different network band from IP band set by LAN1. If the same network band is used, unanticipated activity might occur.

### 8.5.8.5 Gateway and DNS server

1) Gateway uses default gateway address corresponding to LAN1, the default value is set to 192.168.123.254.

2) Default value for DNS server is set to 164.124.101.2.

8.5.8.6 Ethernet Service

The table below is the description of setting items.

| Items | | Default Values | Description |
|---|---|---|---|
| Manager | Port | 5000 | Sets the server port which the SDC-500 Manager is going to connect to the main body (SDC-500) through Ethernet. |
| Modbus | Availability | Not used | Select when providing slave function, enabling to carry data from the main body (SDC-500) to Modbus TCP protocol. (Check in the check box : In use, No check in the check box : Not in use) |
| | Port | 502 | It is set to Modbus TCP protocol's default port 502, and depending on the situation, the user can change to different available port. |
| Web Server | Availability | Not Used | Sets web service connecting permission. (Check in the check box : In use / No check in the check box : Not in use) |
| | Port | 80 | Designates port used for web service |
| LG Air Conditioning | Availability | Not Used | Select when controlling load by connecting LG system air conditioning. (Check in the check box : In use / No check in the check box : Not in use) |
| | IP Address | 192.168.123.10 | Sets LG system air conditioning |

| | | | address |
|---|---|---|---|
| | Port | 1000 | Sets LG system air conditioning port |
| Air Conditioning Control Start Time | | 61 | Does not control load if the values are below the pre-set value. |

8.5.8.7 Modbus Settings

The table below is the description of setting items.

| Items | Default Value | Description |
|---|---|---|
| Modbus ID | 1 | Sets Modbus slave communication ID. |
| Wordswap | Not Used | When using 2 registers with 1 value, change the setting depending whether to use the memory in sequential order or use after switching fore and back registers. <br><br> For example, if using 30001~ 30002, and intended to use internally in 30001, 30002 order; remove check sign from the box. If using in 30002, 30001 order; insert check sign. |

8.5.9 Initialization

This function is used to initialize data before the equipment is used after first installation or during demand power management. Each menus are described in detail below.
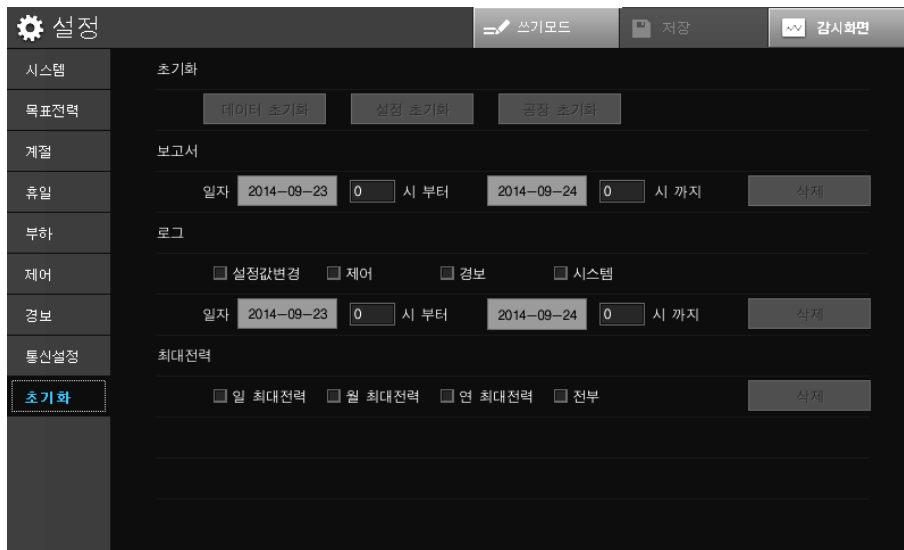
## 8.5.9.1 Data Initialization

Deletes all logs, reports, maximum power data occurred during demand power management.

## 8.5.9.2 Settings Initialization

Restores all setting values changed by the user to the product's initial setting conditions.

## 8.5.9.3 Factory Initialization (Factory Reset)

Restores all data and settings changed by the user to the product's initial conditions.

## 8.5.9.4 Deleting Reports

Delete reports within the selected time gap. (Beginning and end)

For example, if the user sets the beginning time to 0hours 1day 1month 2014year and sets the end time to 0hours 1day 2month 2014year, it deletes the reports that occurred within and including the beginning time report of 00second 00minute 0hours 1day 1month 2014year and ending time. (59second 59minute 23hours 31day 1month 2014year)

## 8.5.9.5 Deleting Logs

Delete logs within the selected time gap. (Beginning and end)

For example, if the user sets the beginning time to 0hours 1day 1month 2014year and sets the end time to 0hours 1day 2month 2014year, it deletes the logs that occurred within and including the beginning time log of 00second 00minute 0hours 1day 1month 2014year and ending time. (59second 59minute 23hours 31day 1month 2014year)

## 8.5.9.6 Deleting Maximum Power

It initializes the whole or specific date's (dd/mm/yyyy) maximum power. Occurrence time is set to current time and the value is marked as 0.

## 8.6. Logs and Reports

## 8.6.1 Logs

This function enables user to check the logs of alarms occurred during demand power management, setting values changed by the user, system conditions, control conditions and etc.

## 8.6.1.1 Alarm
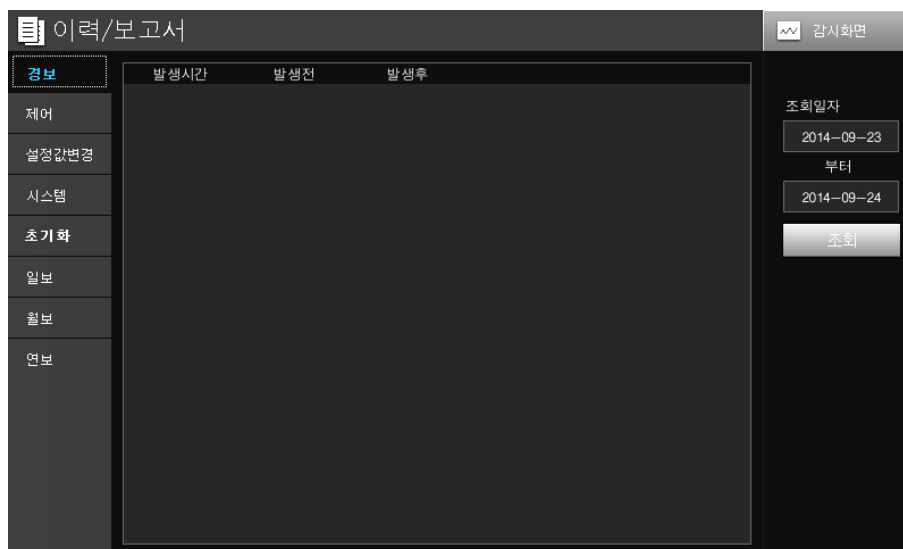
| Items | Description |
|---|---|
| Occurrence Time | The time of alarm occurrence |
| Before Occurrence | Condition values before alarm |
| After Occurrence | Condition values after alarm |

## 8.6.1.2 Control
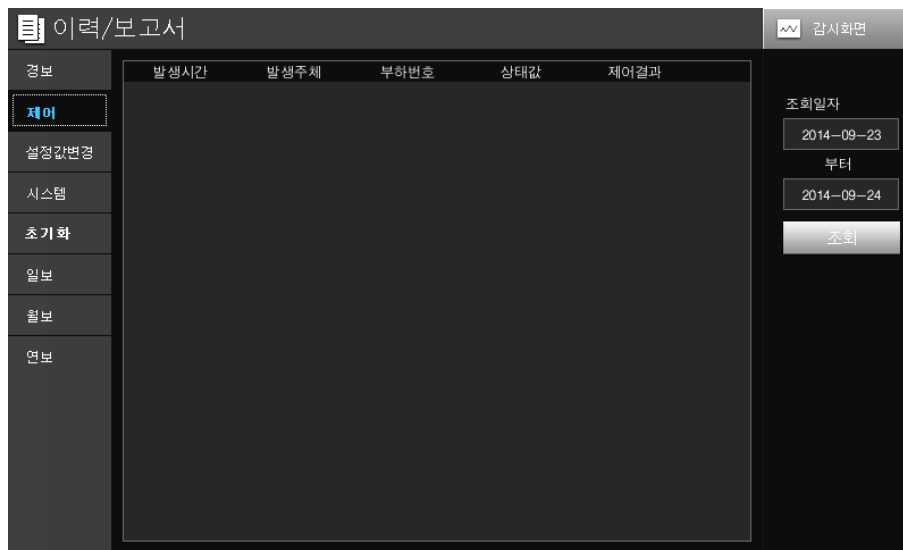


| Items | Description |
|---|---|
| Occurrence Time | Time of control performance |
| Occurrence Subject | If control is operated automatically, it is marked as "System". If controlled manual through SDC-500 Manager, it is marked as "Manager". If controlled through the main body (SDC-500), it is marked as "Touch". |
| Load Number | Load number of the control subject |
| Condition Value | Displayed 'Off' when load is cut off, and displayed 'On' when inputted. |
| Control Results | Displays the result of control success or failure |

## 8.6.1.3 Changing Setting Values
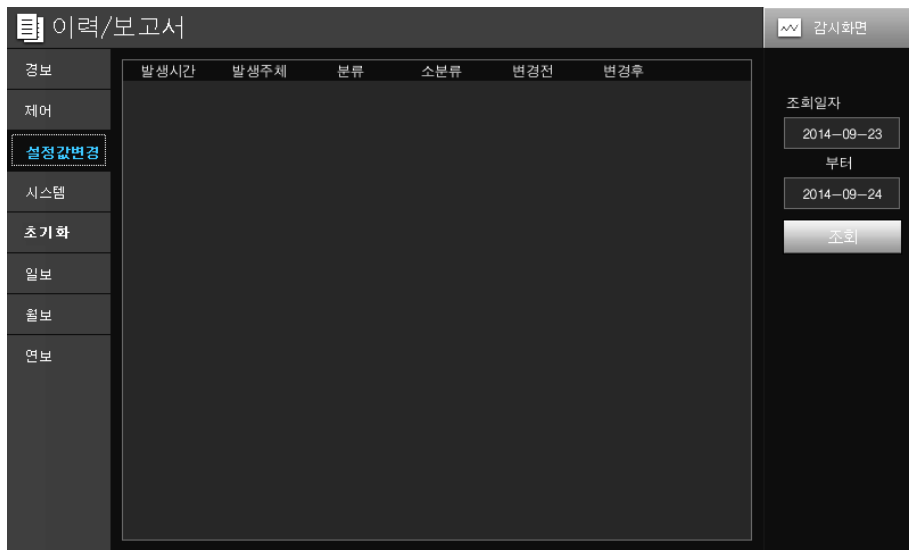
| Items | Description |
|---|---|
| Occurrence Time | The time when the settings were changed |
| Occurrence Subject | If settings are changed through SDC-500 Manager, it is displayed "Manager". If settings are changed through the main body (SDC-500), it is displayed "Touch". |
| Classification | Hierarchically classifies settings |
| Minor Classification | Detailed classifications of settings |
| Before Change | Displays the setting values before change |
| After Change | Displays the setting values after change |

8.6.1.4 System Logs

| Items | Description |
|---|---|
| Occurrence Time | Displays occurrence time |
| Occurrence Subject | If occurred in SDC-500 Manager, it is displayed "Manager". If occurred in the main body (SDC-500), it is displayed "Touch" or "System". |
| Classification | Displays the type of message |
| Content | Detailed description on the classification (type) |

8.6.1.5 Log of Initialization
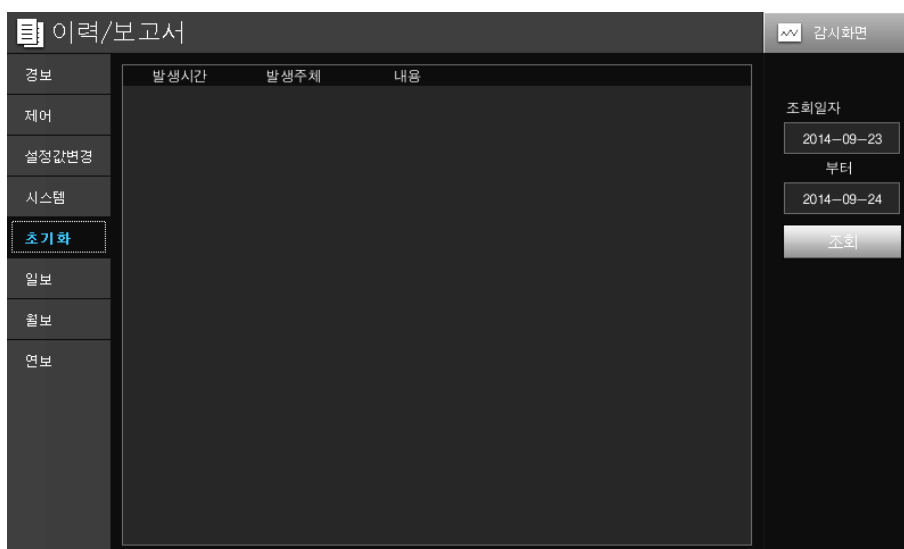
| Items | Description |
|---|---|
| Occurrence Time | Displays the time of initialization |
| Occurrence Subject | If initialized in SDC-500 Manager, it is displayed "Manager". If initialized in the main body (SDC-500), it is displayed "Touch". |
| Content | Describes the initialized items |

8.6.2 Reports

This menu saves and checks the power values with usage of demand power management based on its load time, time, and date. To save, connect USB terminal behind the main body (SDC-500) and when screen displays like below, search the intended data (report) and tab SAVE button.
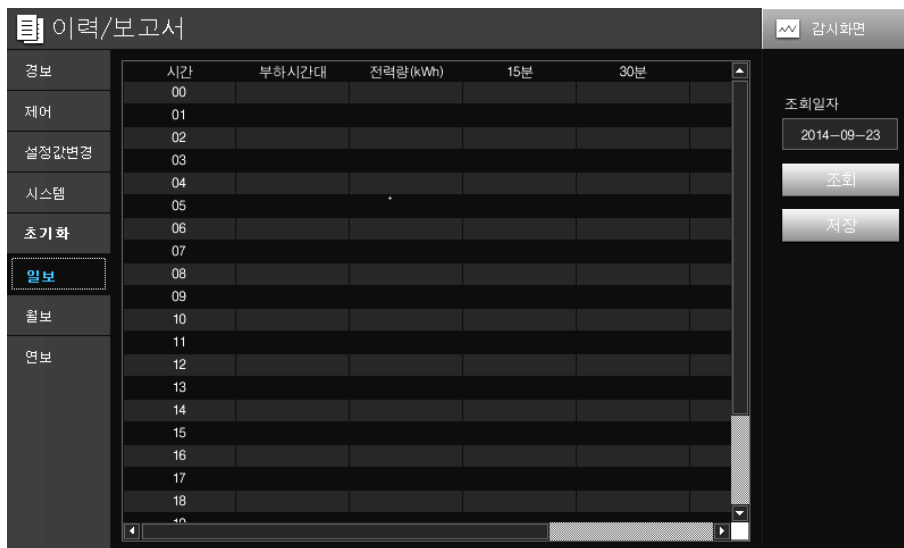


Caution) USB memory's storage capacity is 32GB.

8.6.2.1 Daily Report

Displays usage in hourly and 15 minutes intervals
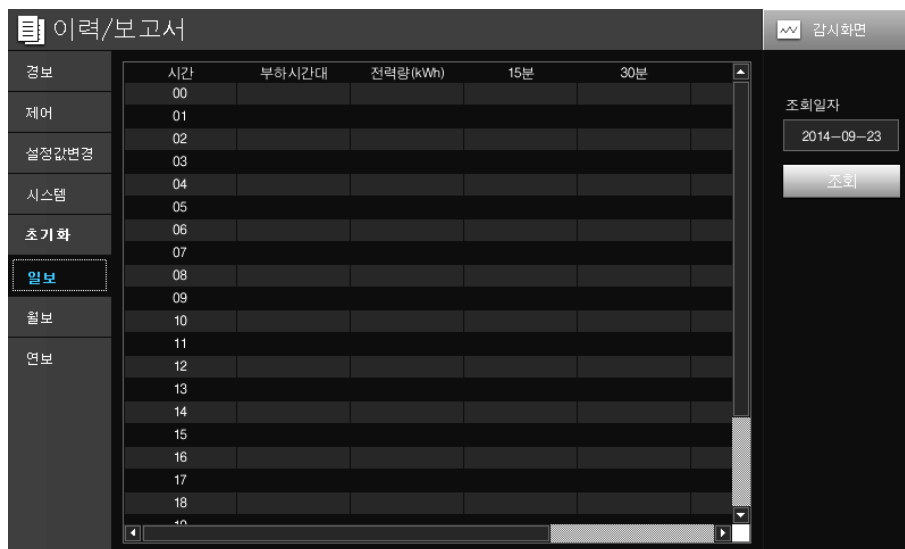
| Items | Description |
|---|---|
| Time | Displays time |
| Load Time Slot | Displays load time slot corresponding to the time |
| Wattage (kWh) | Displays usage during an hour |
| 15 minutes | Displays power during 0~ 15 minutes |
| 30 minutes | Displays power during 15~ 30 minutes |
| 45 minutes | Displays power during 30~ 45 minutes |
| 60 minutes | Displays power during 45~ 60 minutes |

8.6.2.2 Monthly Report

Displays usage in daily and load time slot intervals

| Items | Description |
| --- | --- |
| Day | Displays day |
| Maximum Power (kW) | Displays maximum wattage during the day |
| Wattage (kWh) | Displays usage during the day |
| Light-load | Displays light-load time slot |
| Middle-load | Displays middle-load time slot |
| Maximum Load | Displays maximum load time slot |

8.6.2.3 Annual Report

Displays usage in monthly and load time slot intervals
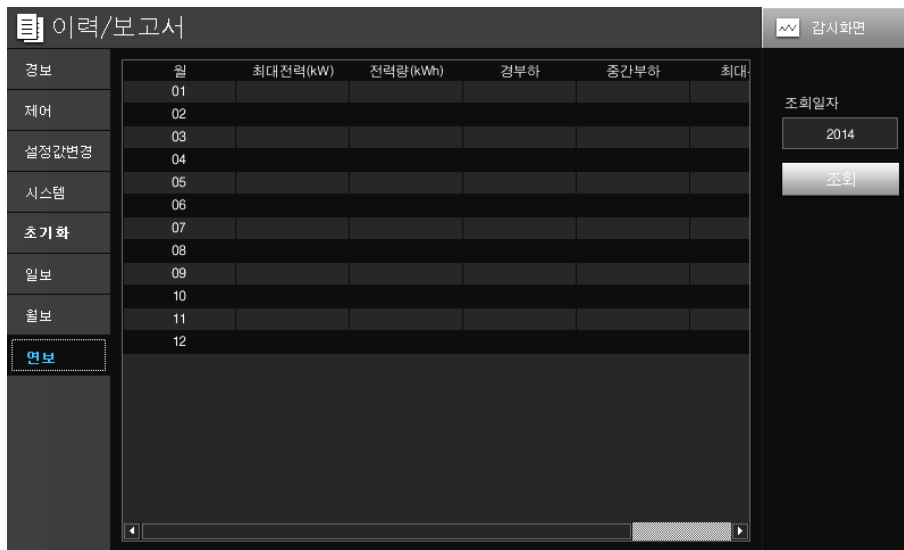
| Items | Description |
|---|---|
| Month | Displays month |
| Maximum Power (kW) | Displays maximum wattage during the month |
| Wattage (kWh) | Displays usage during the month |
| Light-load | Displays light-load time slot |
| Middle-load | Displays middle-load time slot |
| Maximum Load | Displays maximum load time slot |

## 9. SDC-500 Manager

### 9.1 Outline

SDC-500 Manager software is connected to the main body (SDC-500) through Ethernet and enables real-time monitoring and control of data using PC; the data such as, setting values, target power, estimated power, standard power, current power, demand time deadline, alarm conditions, load conditions, remote load control unit (LRCU-500) and etc.

Also, the software provides inquiry and printing out of logs and reports, supports saving data through Excel files, and real-time display of demand power graph.

The web version (Android, IOS, and Browsers for PC) enables monitoring/ inquiring

despite the platform type.(Only if the browsers support HTML5) In this manual, standard instructions are described using Google's "Chrome" and we advise the users to use the same.

Caution) Even if the browsers support HTML5, display resolution and layout (depending on the browser's characteristics) may look different.

9.2 Installation Guide

9.2.1 System Requirements

1) The operating system supported by SDC-500 Manager is as followed.

Windows 7

Windows 8

Windows 8.1

2) The PC's recommended system requirements for installation of SDC-500 Manager is as followed.

Hard Disk Memory: 100 Mbytes of available space in installation folder

CPU and Memory: The standard recommendations given by the operating system

9.2.2 Installation

Installation related files of SDC-500 Manager are in the Manager folder of installation CD. Double click the Setup.exe file and the following screen shows.

Read the messages and click Next to complete installation.

Designate the folder of installation and click Next.

Read the messages and click Next.

The installation is in progress. Wait for a moment and automatically moves to the next page.

Read the installation complete message and click Close.

Caution) Operates in Microsoft .NET Framework 4.0 base.

9.3 Operating Guide

9.3.1 Starting and Basic Screen

9.3.1.1 Starting Screen

When executing SDC-500 Manager, a log-in screen appears like the image below. If the program is being installed for the first time in the PC, check and input the main body's (SDC-500) IP address and input password (default password: 1234) then click log-in button. Password can be changed in the Settings-System Menu. If normal log-in procedure is completed, basic screen like the image below will appear.

When starting the program, use reading password to log-in. Default IP is registered when initially operated, and in cases of accessing through a different IP, use the "Log-in to Other Server" button to access.
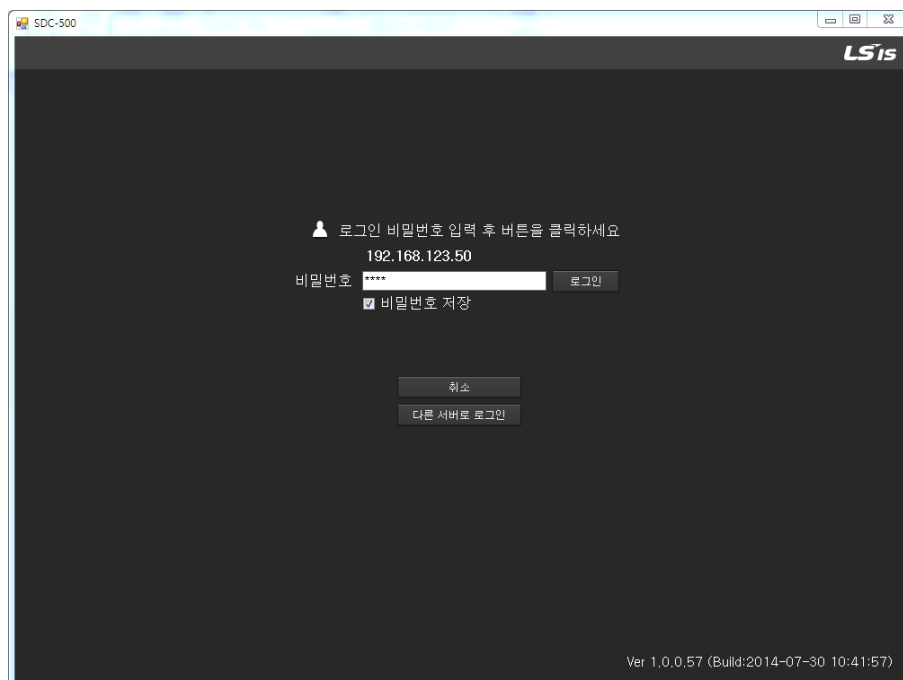


9.2.1.2 Basic Screen

Default screen is similar to the main body's (SDC-500) screen, and most of its functions and methods are identical.

9.3.2 Basic Screen

Basic screen is shown right after log-in process is finished, and the screen shows value and graphs of estimated power, current power and others for effective monitoring. Also, the screen shows hourly to annual maximum usage of power intuitively.
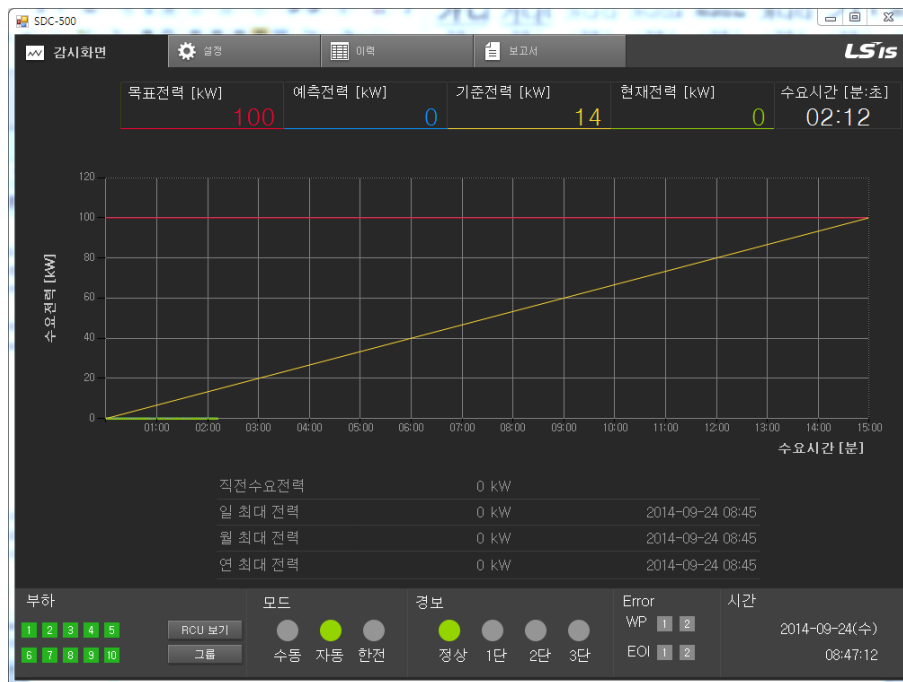


9.3.3 Features in Menu

Features of starting screen menus in SDC-500 Manager are described in the table below.

| Items | Description |
|---|---|
| Monitoring Screen | Can move to starting screen (monitoring) |
| Settings | Can change settings necessary for demand power management |
| Logs | Can query/save logs |

| | |
|---|---|
| Reports | Can query/save reports |
| See RCU | Can check and control the main body's (SDC-500) load, remote load control unit's (LRCU-500) conditions and load (In case of linked air conditioning system) |
| Group | Can check and control pre-set groups |

Features of main screen menu


### 9.3.4 Operation

SDC-500 Manager program has monitoring, settings, logs, reports functions in the menu.

### 9.3.4.1 Starting Screen

The screen shown below is the monitoring screen with the functions of monitoring main body's (SDC-500) power and immediate, daily, monthly, annual maximum power, load conditions, alarm conditions, and error conditions.
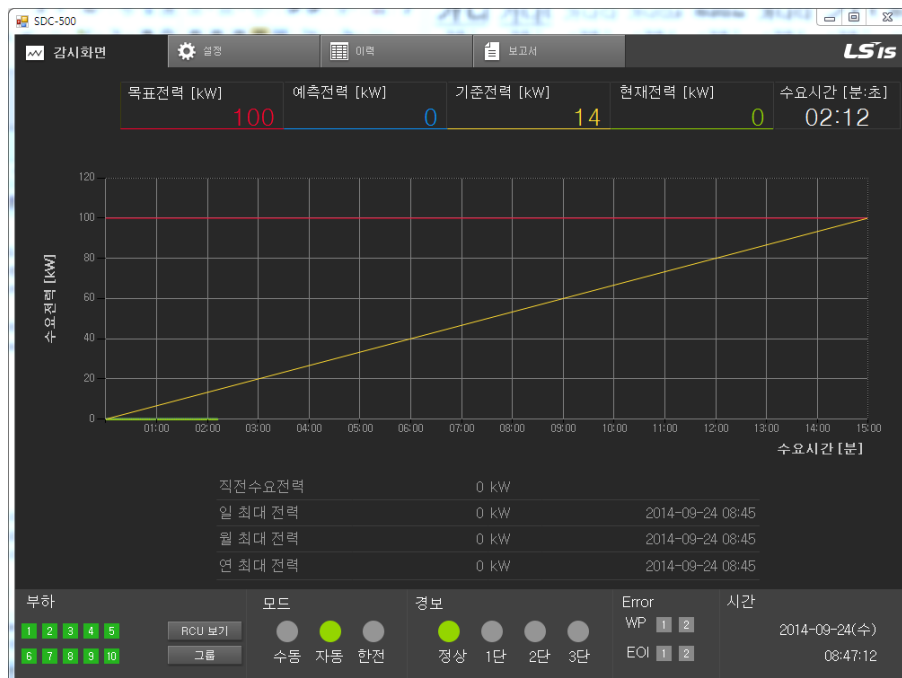


### 9.3.4.2 See RCU

'See RCU' menu is a sub-function in monitoring screen, and can monitor and control all loads, and can monitor air conditioning system's load conditions if air conditioning system is linked.
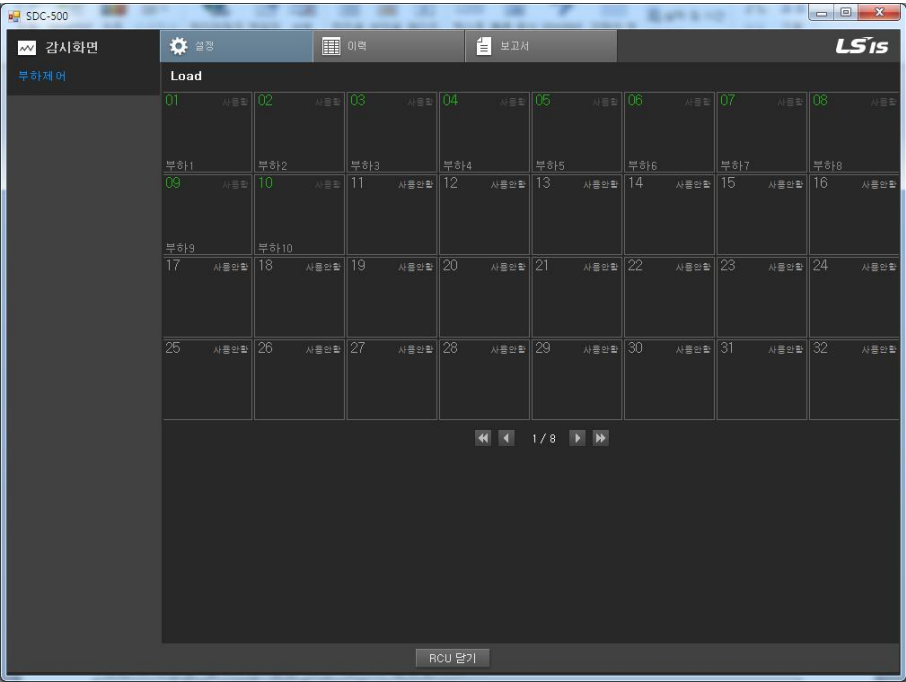


The following image is the cell showing load.

Upper-left number "01" represents the load number and the color represents the definition given in '8.3.1 Load Condition' in our manual.

| LED Color | Description |
|-----------|-------------|
| Green | Load input status |
| Red | Load cut-off status |
| Grey | Not in use or unknown status |

Upper-right corner's 'Use' represents whether the load is being used or not.

Bottom-left corner's 'Load1' represents the load detail.

Description of a pop-up menu when right button is clicked (Right-click)

| Control | Can control currently selected load |
|---|---|
| | Only if, operation mode is in 'manual' mode |
| Information | A window containing the information of currently selected load is shown. |
| | Descriptions about the items are identical with the descriptions in '8.5.5 Load' |

9.3.4.3 Settings

Settings section allows the user to check any necessary items when processing maximum demand power management and settings can be changed by the user depending on the situation.
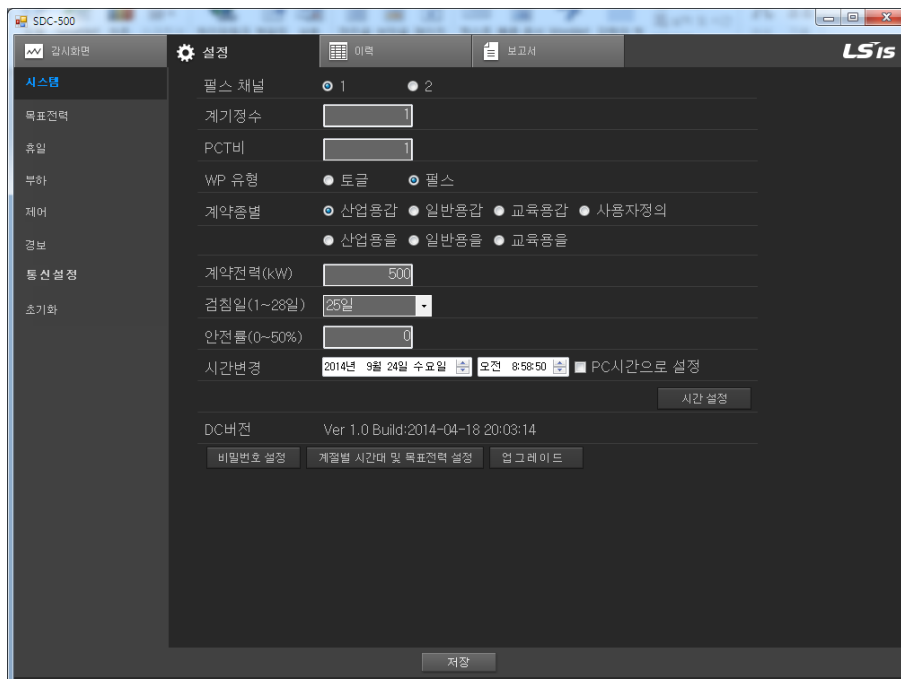
9.3.4.4 Logs

It can query occurred errors, control conditions, system conditions, alarm conditions and etc. in daily basis and can be saved in text (csv) format.
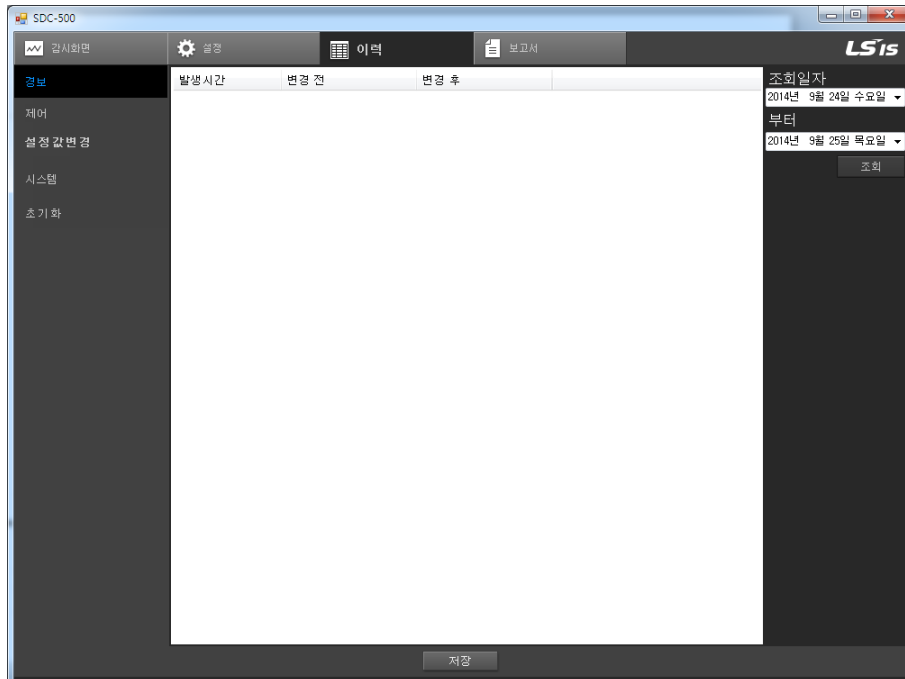


9.3.4.5 Reports

Reports can be queried in daily basis and the reports show watt-hour in load time slot, maximum power usage and etc. The default save format is in text (csv) format and in case Microsoft's Excel program is installed, report is saved in Excel format.
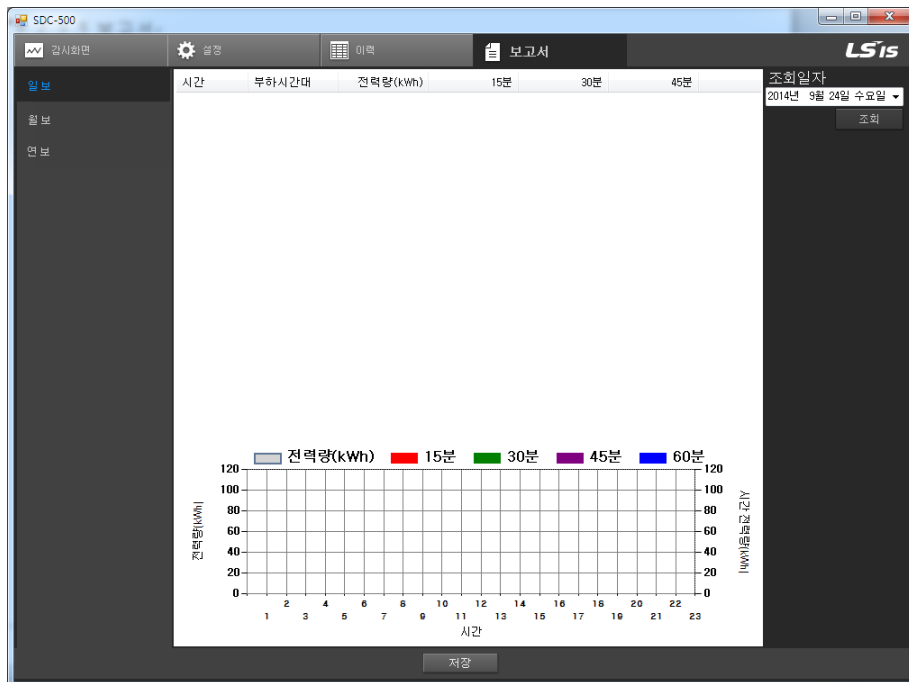
10. Web

10.1 Android

10.1.1 Installation

① Tab "Play Store"

② Search for "Chrome" in the store

③ Tab "Chrome Browser" in the searched list of applications

④ Tab "Install"

⑤ Tab "Accept"

⑥ Tab " Update"

⑦ Tab " Open"

10.1.2 Connect
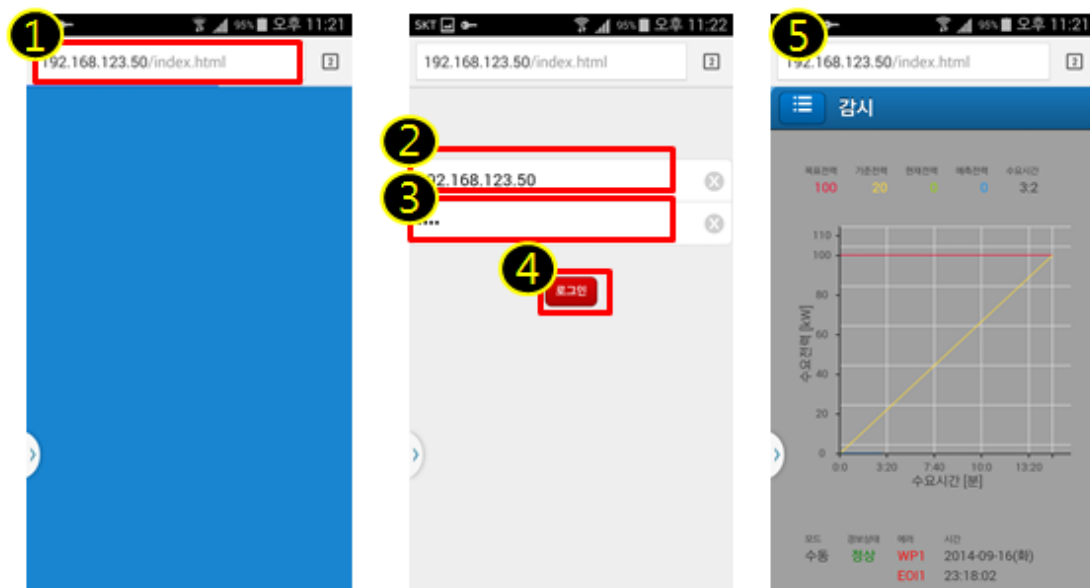
①　Type in the IP address of the main body (SDC-500).

②　Connected IP is displayed.

③　Enter password.

④　Tab "Log-in" button.

⑤　Displays monitoring screen when successfully logged-in.

10.1.3 Menu Maneuvering
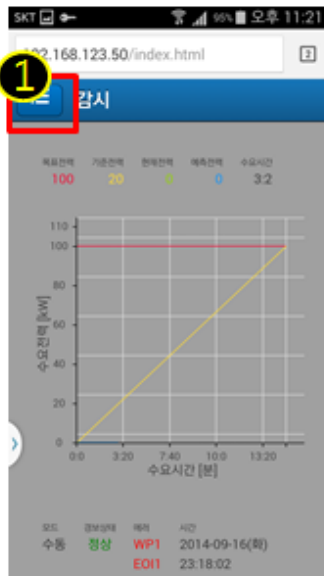
① Tab the button.

② Tab "Daily Reports" in the opened menu.

③ Moves to the selected menu.


10.1.4 Query



① Tab on the date.

② Select the date in the lower part of the screen and tab "Ok" button.

## 10.2 IOS

### 10.2.1 Installation

① Tab "App Store"

② Search for "Chrome" in the store

③ Tab "Download"

④ Tab "Open"

### 10.2.2 Connect
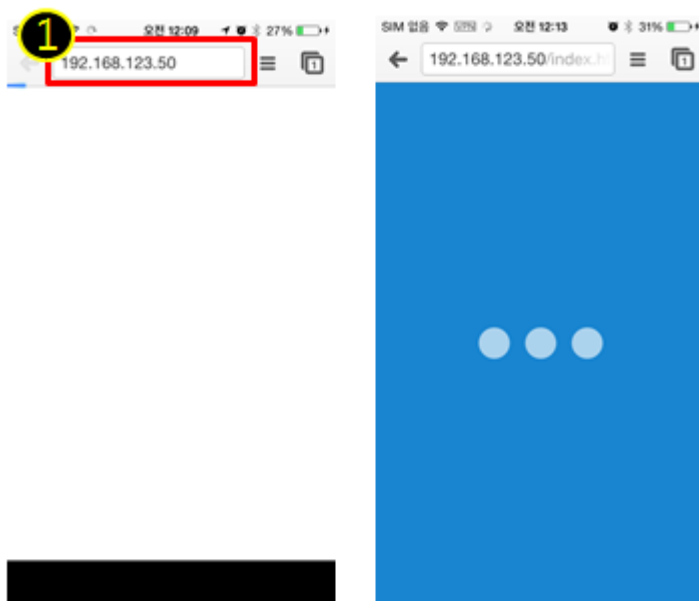


① Type in the IP address of the main body (SDC-500).
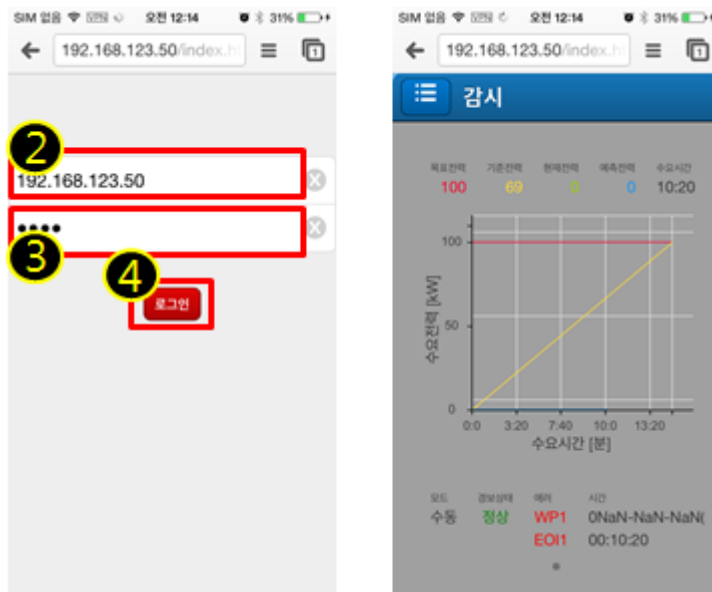
② Check the main body's (SDC-500) address and edit.

③ Type in the password.

④ Tab log-in.

10.2.3 Menu Maneuvering

Identical to 9.3.3 Menu maneuvering

10.2.4 Query

Identical to 9.3.4 Menu maneuvering

10.3 Windows

10.3.1 Installation

Click on "Internet Explorer" in the desktop or in the start menu.

Type in "https://www.google.co.kr/"and click "Download Chrome" on the upper-right corner.

After moved to the download page, click "Download Chrome"

Follow the next several given directions and complete installation.

10.3.2 Connect



Double-click "Chrome" icon on the desktop to run.
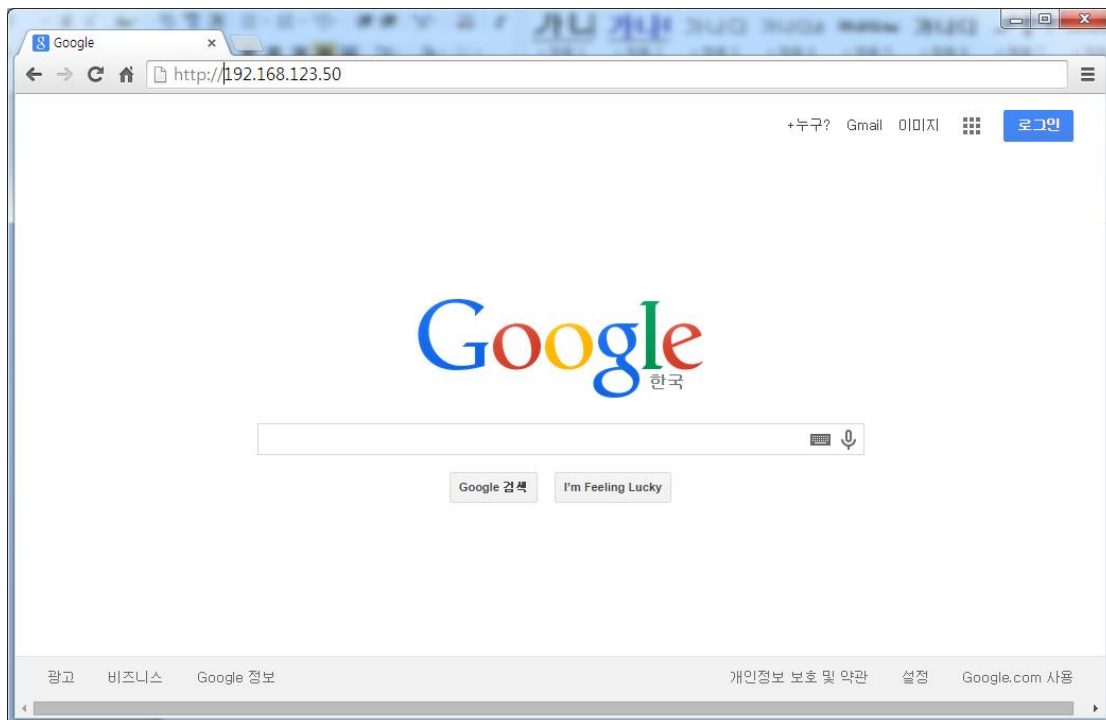


Type in the address of the main body (SDC-500) (The default address is set to 192.168.123.50)
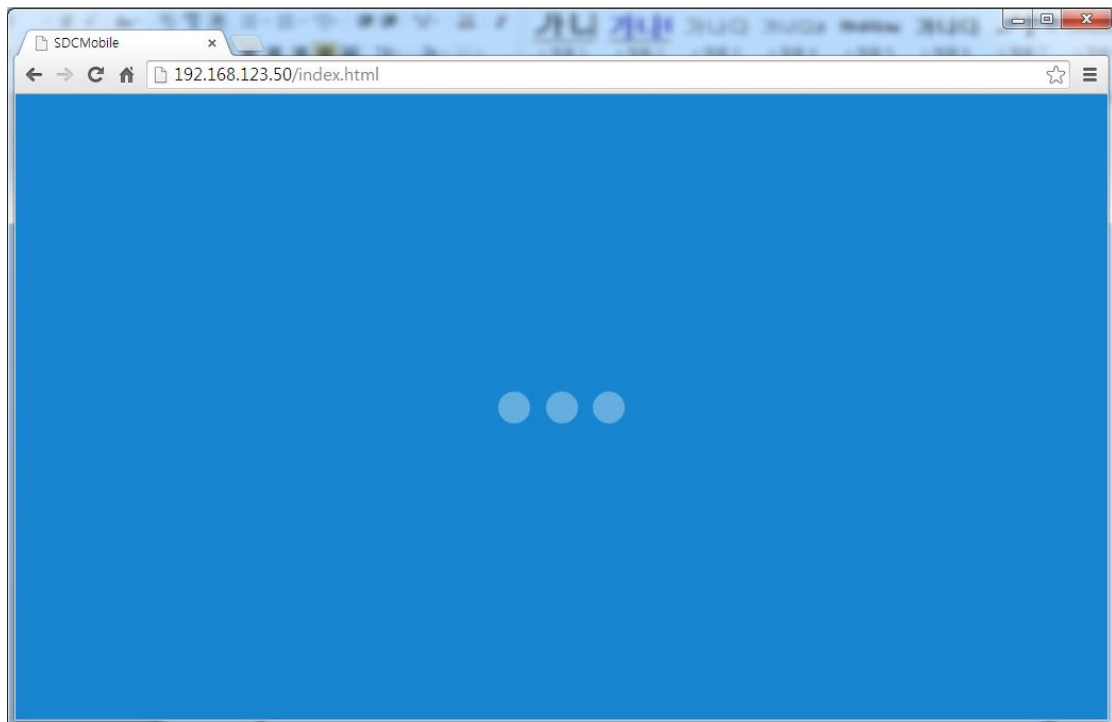
Wait until the log-in screen pops up.
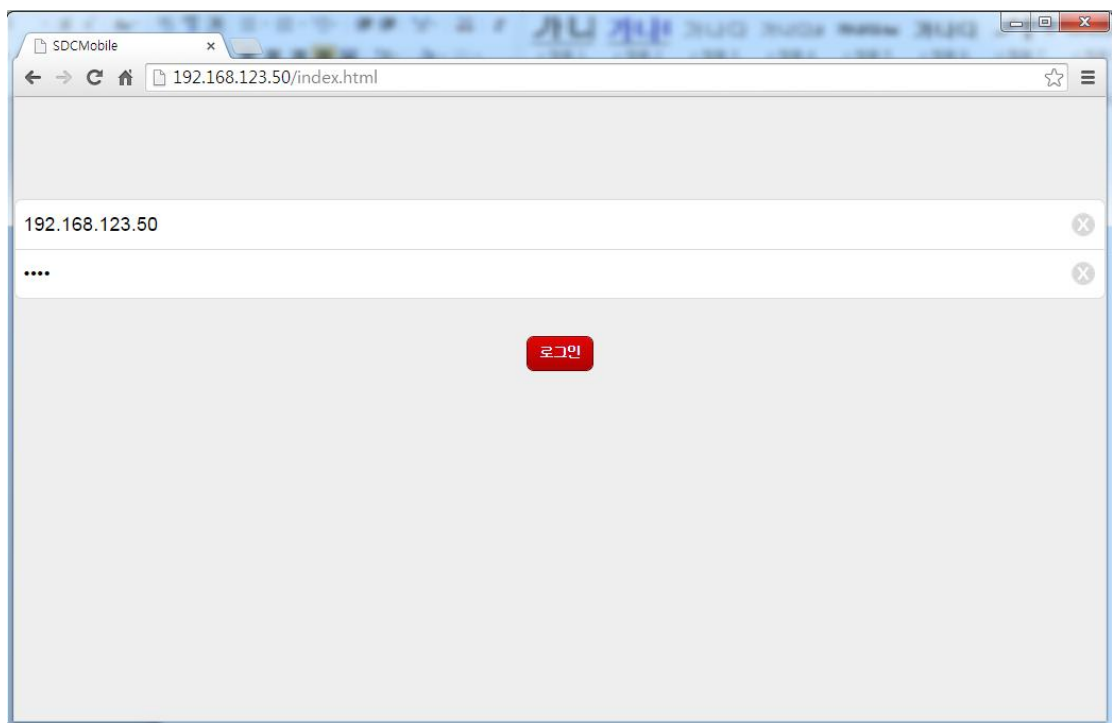


Type in the password and click log-in button.

Default password is set to "1234".
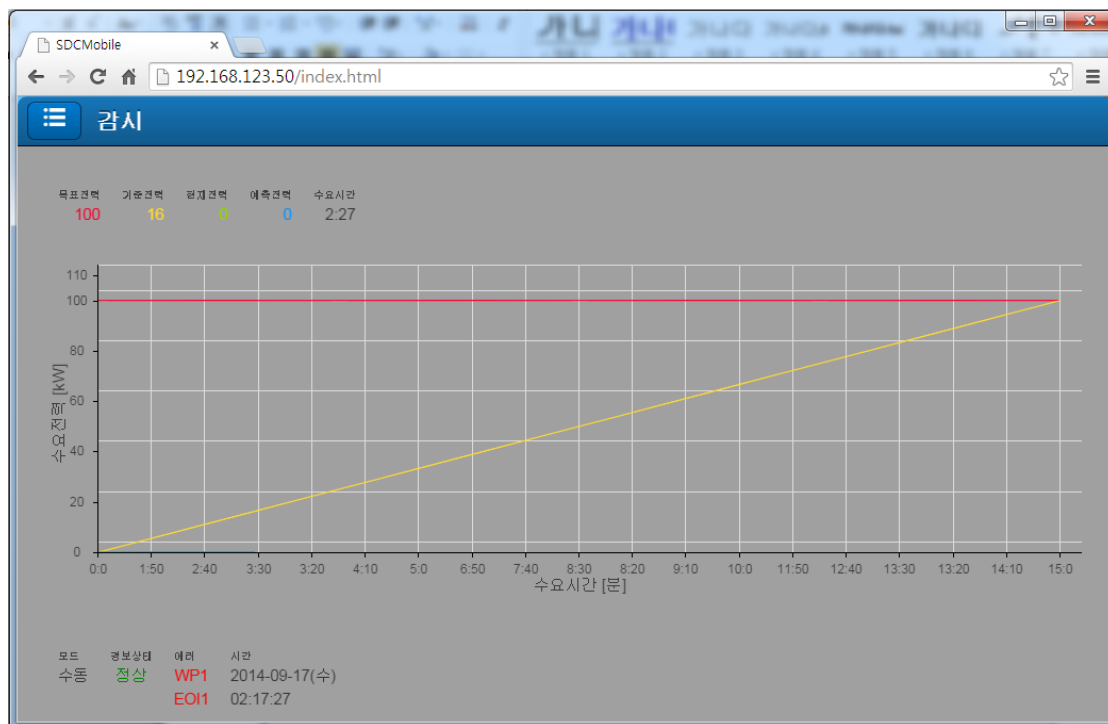
Monitoring screen is displayed when logged in successfully.

### 10.3.3 Menu Maneuvering
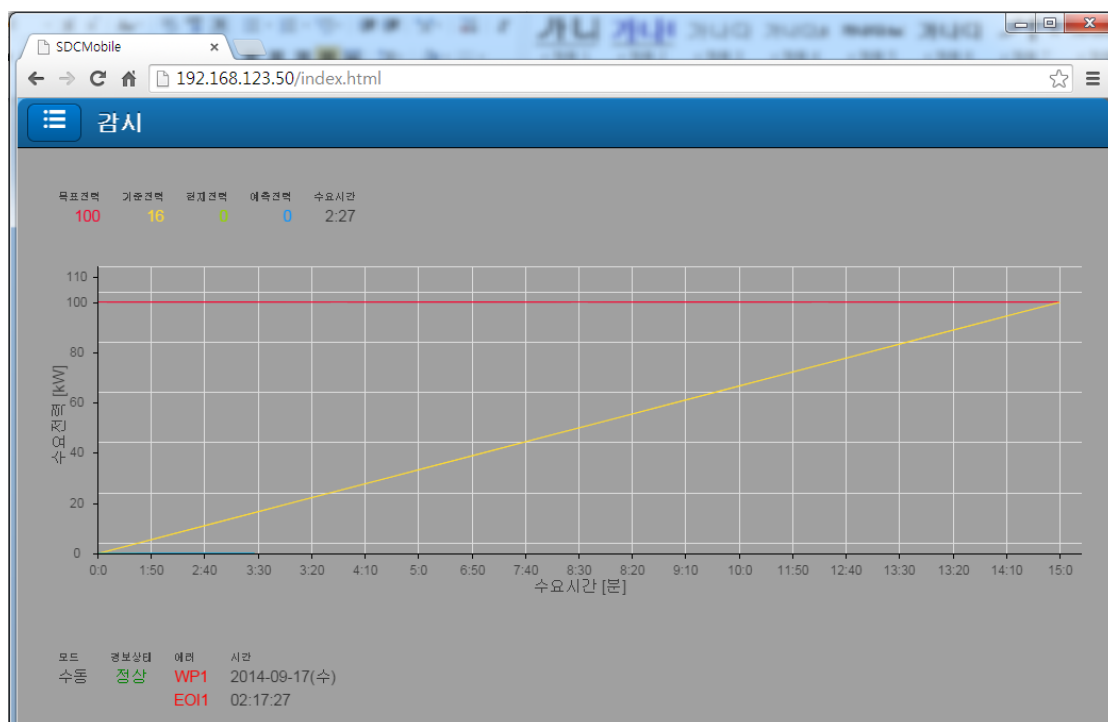
Click on menu button to move to other menus.
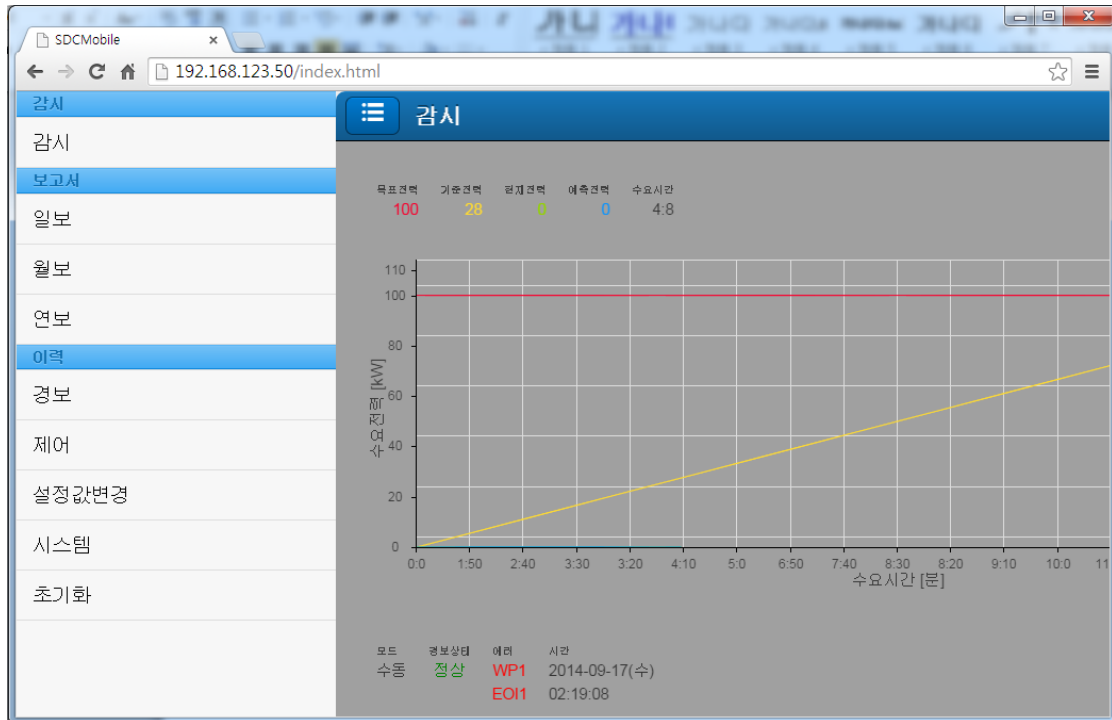


Select the menu on the left side of the page and moves to the selected menu. (After selecting the menu, the list in the left side of the screen closes)

Click on the date to change the date to query.



Select the date in the below section and click OK.

## 11. Firmware Upgrade

## 11.1 Upgrade

This function is only supported in SDC-500 Manager.

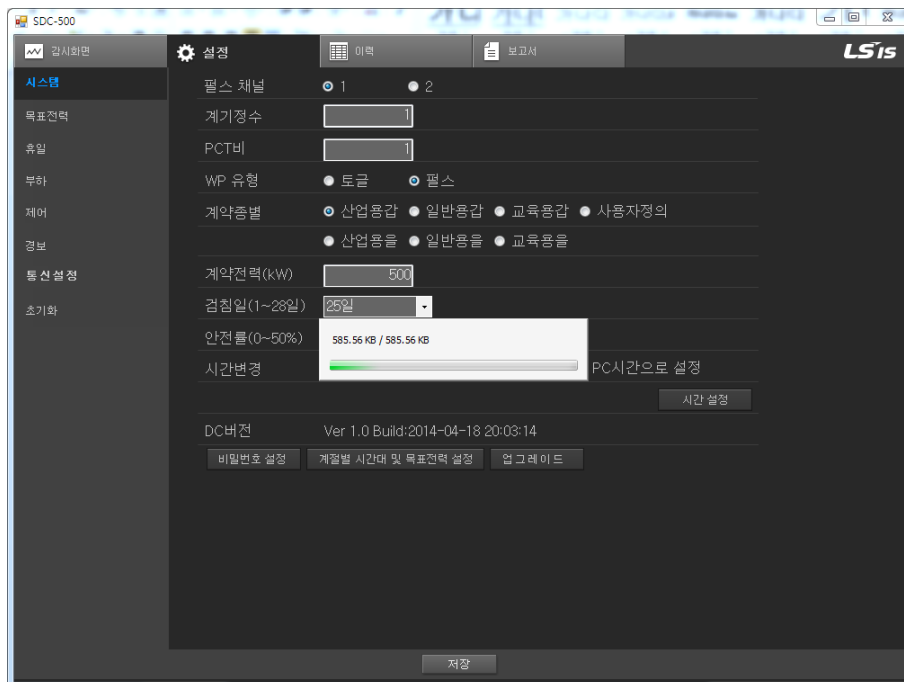### 11.1.1 Preparation

Run SDC-500 Manager and move to Settings-Menu.



### 11.1.2 Upgrade

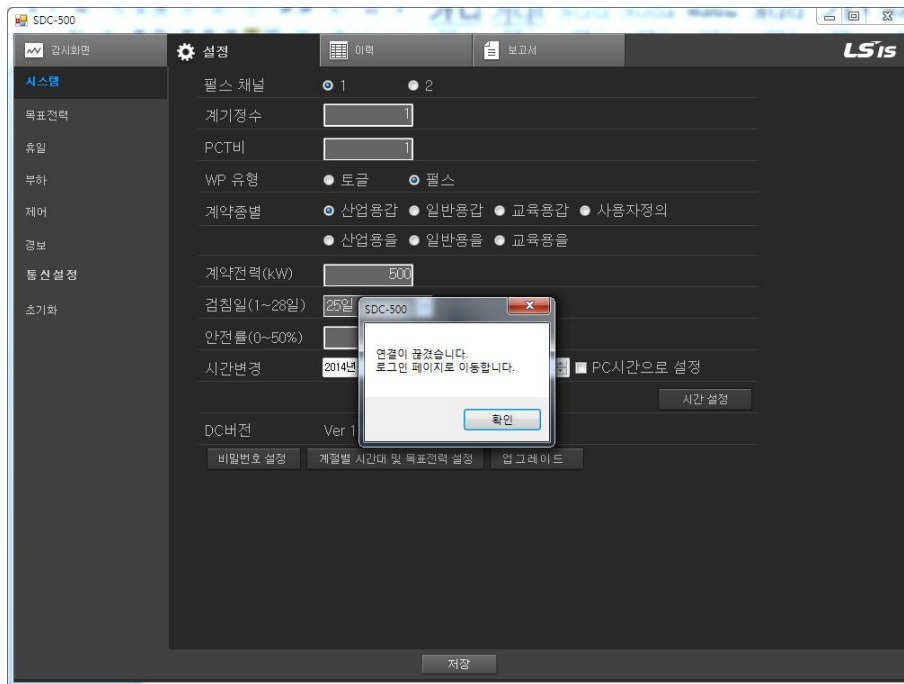Click 'Upgrade' button.

Select the firmware to be upgraded.
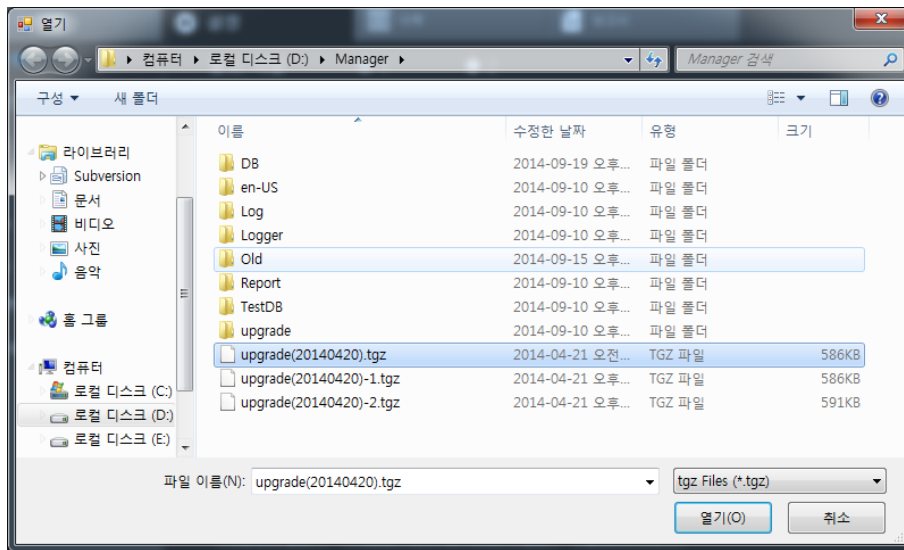
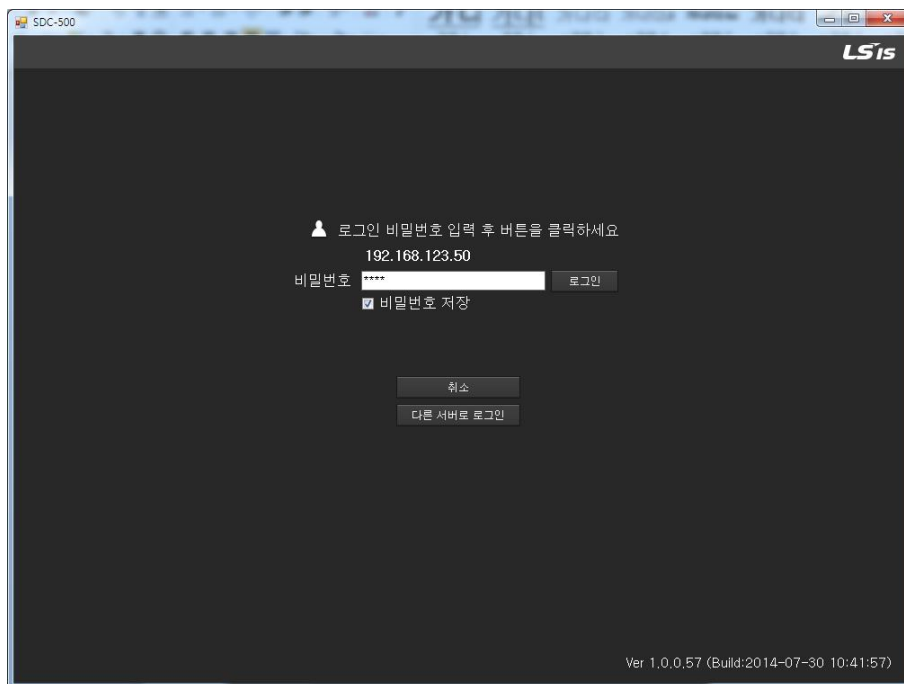Click open and proceed upgrade.



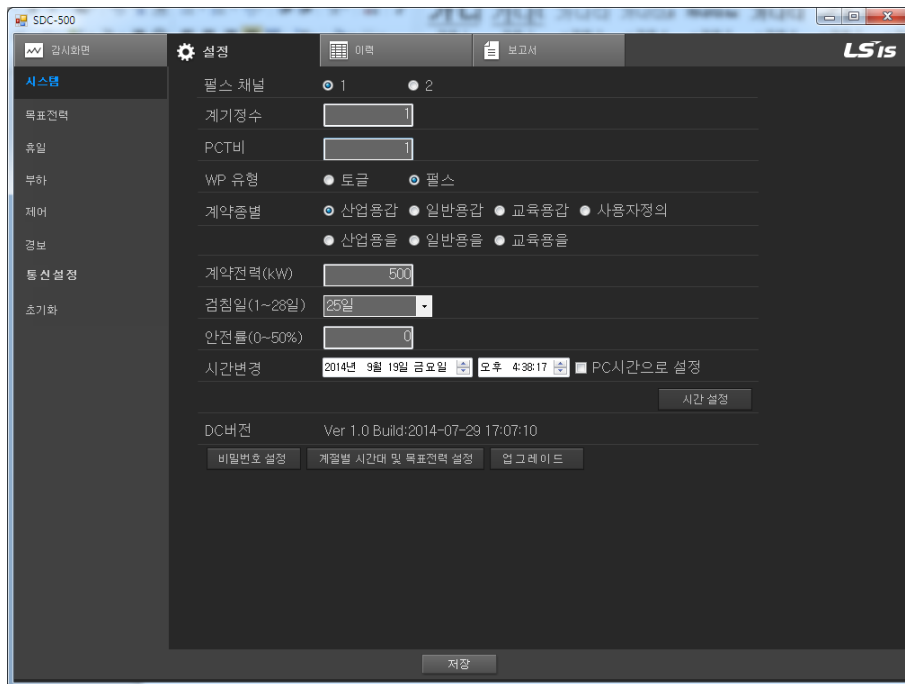[Message screen during update]

When upgrade is completed, a message appears like the image below.

Click Ok and move to the log-in page.



Log in and move to settings-menu.

Check DC version if it is different from the firmware version.