

WEB GATEWAY PRODUCT SPECIFICATION

MODEL : SC-WGW-AR

Product Drawing No. : PSZ006A012CA

Ver. 2.0

Oct. 1, 2006

**MITSUBISHI HEAVY INDUSTRIES, LTD.
AIR-CONDITIONING & REFRIGERATION
SYSTEMS HEADQUARTERS**

1. INTRODUCTION

1.1 SCOPE

This product specification is applied to the WEB Gateway SC-WGW-AR that connects a Control & Monitor personal computer with the MITSUBISHI HEAVY INDUSTRIES' "SUPERLINK" networks by the "WEB"*¹ communication protocol. This document describes the specifications of the product as for Oct. 1, 2006. Any contents of this document may be changed without prior notification.

*¹ This product uses the WEB HTTP communication protocol which is widely used in the Internet.
However, this Gateway is basically for use in a local LAN.

1.2 STANDARD PACKAGE

The standard package of this product includes the followings;

- A Gateway SC-WGW-AR unit
- User's manual
- Installation manual

The following materials are not included in the standard package.

- Personal computer systems for monitor and control.
- LAN materials such as Ethernet cables and switching hubs

1.3 ENGINEERING WORK

"Engineering work" means technical service work such as dispatching engineers to the site, the address allocation planning work, configuration of this Gateway, trial operation of the system and so on. These engineering works may be paid services.

1.4 CUSTOMIZE WORK

This WEB Gateway is a kind of ready-made product. Customization of the functions of this Gateway will not be supplied.

2. SYSTEM ARCHITECTURE

2.1 SYSTEM DIAGRAM

Fig.2.1.1 shows a basic case of the system diagram of connection between the building management system host computer, the WEB Gateway and the SUPERLINK control networks.

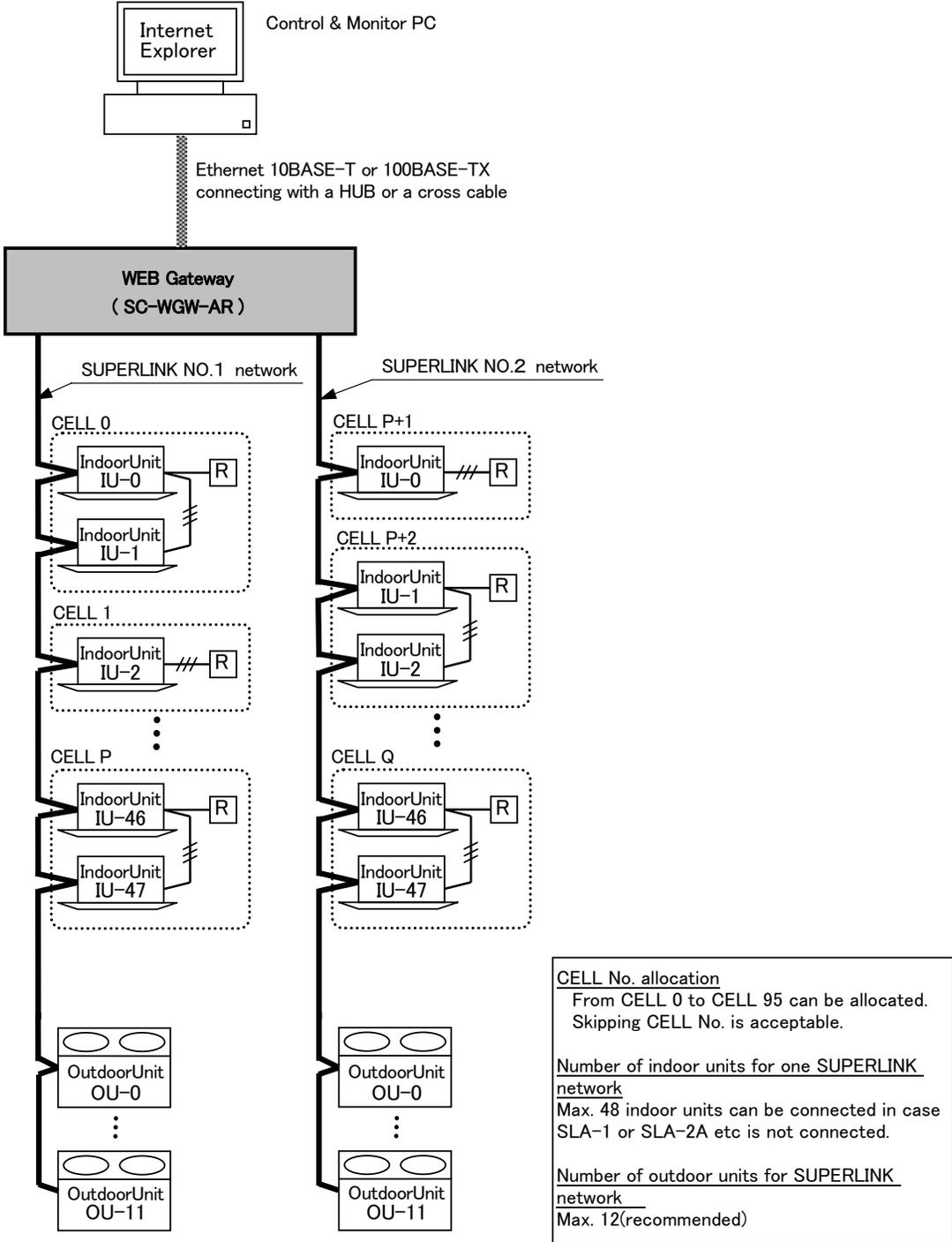


Fig. 2.1.1 System Diagram (Basic case)

Fig.2.1.2 shows a case of the system diagram of connection between the building management system host computer, the WEB Gateway, and the SUPERLINK control networks along with SUPERLINK option controllers such as SLA-1 or SLA-2A. The SC-AD-L adapter should be used for connection of MHT's single type packaged air-conditioner models.

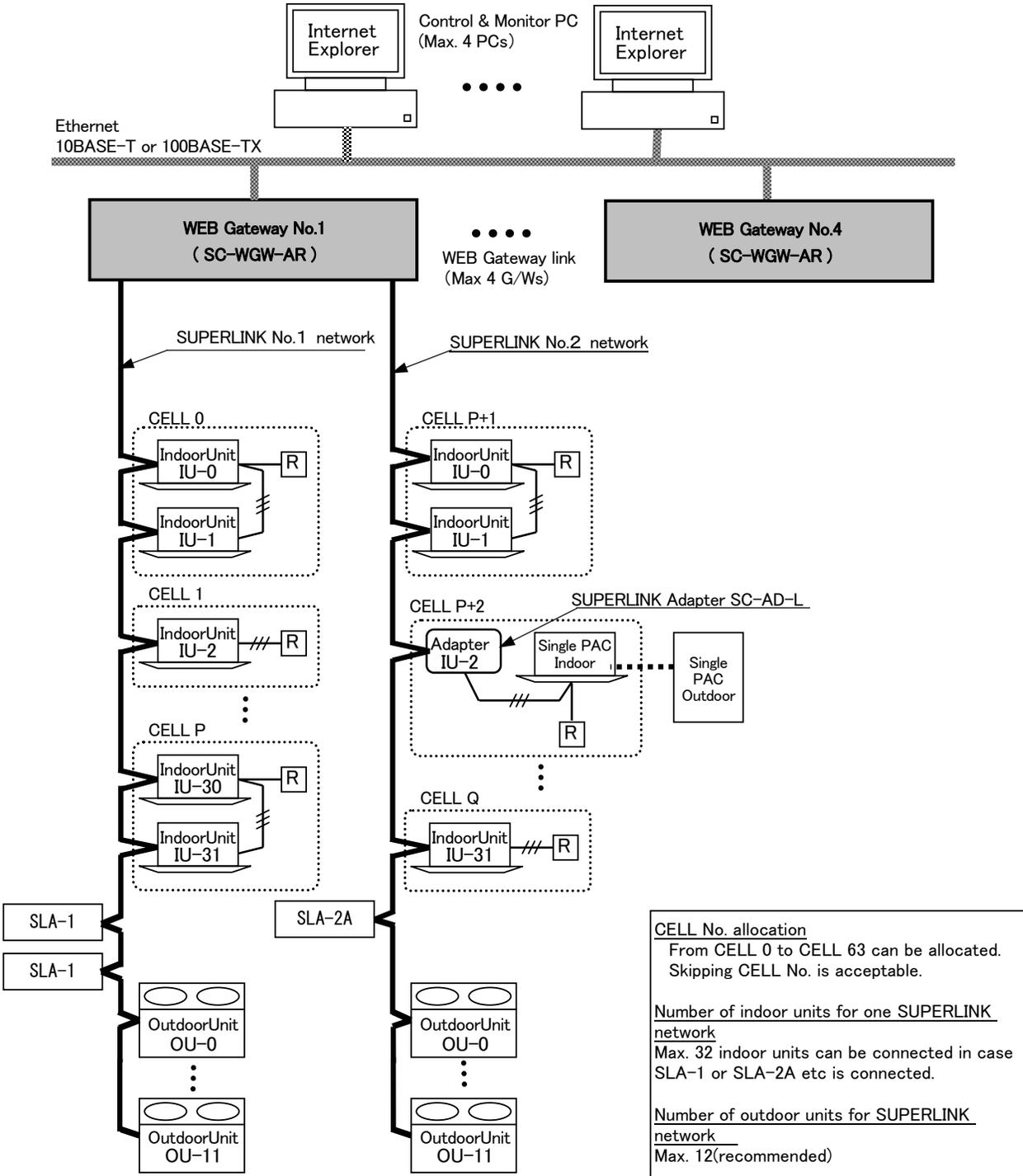


Fig. 2.1.2 System Diagram (Option controller connected)

2.2 ETHERNET NETWORK

(1) Private Ethernet

As shown in Fig.2.1, recommended network environment for this Gateway system is the private local Ethernet line for exclusive use. In other words, no network nodes except this Gateway and the PCs for this system are connected to the Ethernet line. Connection to the Intranet (i.e. office LAN) or the Internet may be possible under responsibility of the network administrator on the site and with paid engineering work.

Network wiring for the Ethernet line shall be done according to each network equipment manufacturer's wiring specifications. This Gateway does not require special wiring for the Ethernet line and assume the following Ethernet specifications:

- 10BASE-T or 100BASE-TX twisted-pair cable Ethernet

The IP address for this Gateway has been set before shipment as the following initial IP address for the CLASS C PRIVATE ADDRESS:

- Initial IP Address: 192. 168. 0. 110

Alternation of the IP address of this Gateway has to be done by editing the initial network configuration file for this WEB Gateway's software. This procedure requires high technical knowledge on computer networks. In the case of IP address alternation, consult the dealer of this product.

(2) Network Security

This Gateway does not have any special measures for the Ethernet network security such as counter measures for evil attacks from the network, network virus and so on. It is assumed that this Gateway will be used in the private Ethernet network. If this Gateway is connected to an office LAN or the Internet, there might be risks for injustice access, and consequently, this Gateway might be altered to be harmful communication source to other network nodes.

It is not the responsibility of this Gateway to such injustice network access and is exempted from compensation for the damage by such unexpected attacks.

2.3 CONTROL & MONITOR PC

(1) PC Models

Personal computers used as the WEB browsers for this system are out of the product supply scope. The personal computers with relating software and hardware should be prepared by the customer. Minimum performance conditions of the PC are as follows:

- CPU clock : 500MHz or above. (2GHz or above recommended.)
- Main memory : 128MB or above. (512MB or above recommended.)
- Screen size : 1024 x 768 or above. (1280 x 1024 recommended.)

(2) Operating System and WEB Browser

The recommended Operating System and WEB Browser versions for both the Control and Monitor PC and the Monitor PCs are followings:

- Operating System : Microsoft Windows XP or 2000
- WEB Browser : Microsoft Internet Explorer, version 6.0 or above.

This Gateway system executes only the Internet Explorer on the PC side. The Gateway does not automatically download any executable codes to the PCs.

2.4 AIR-CONDITIONER CONNECTION

(1) Packaged Air-Conditioner Models

- MHI's Multi KX series
- MHI's Multi GHP series
- SC-AD-L adapter + Separate PAC series

When the SC-AD-Ls are used, some functions will become invalid. The detail explanation of the limitations for the SC-AD-L will appear in the later version of this document.

(2) "AIR-CON CELL"

A group of indoor units connected by the remocon line is called an "Air-con CELL" in this WEB Gateway

system. An Air-con CELL is defined as a logical group of indoor units for control & monitor from this WEB Gateway. In the Fig.2.1.1 and Fig.2.1.2, an Air-con CELL is indicated by a surrounding dashed line. The indoor units of the CELL should be on the same SUPERLINK network. But the CELL identification numbers can be allocated over the SUPERLINK networks as shown in Table 2.4 below.

Sending a control command to a CELL is equal to sending the control command to every indoor unit of the CELL. It is possible to control and monitor each individual indoor unit by defining a CELL as an indoor unit. All indoor units in the same CELL must be connected by the same remote controller, that is, a remecon group connection.

The CELL grouping definition is common to all the functions of this Gateway. The CELL definition is provided by the PAC information file. The information file must be set before the test operation of this Gateway. This PAC information file is memorized by the non-volatile memory of this Gateway once it is uploaded.

(3) Max number of indoor units

The maximum number of indoor units connected is shown in the Table 2.4 depending on connection of the SUPERLINK option controller such as SLA-1 or SLA-2A. The reason why the number of indoor units connectable is reduced in the case of option controller connection is for communication traffic limitation.

Table 2.4

	Without option controller	With option controller(*)
Number of SUPERLINK networks	2 networks	2 networks
Number of indoor units	Max48 units x 2 = Max 96	Max32 units x 2 = Max 64
Number of CELLS	Max48 CELLS x 2 = Max 96	Max32 CELLS x 2 = Max 64
Range of CELL number	CELL 0 to CELL 95	CELL 0 to CELL 63

(*) Option controllers should be max. 2 of SLA-1 or only one of SLA-2A for one SUPERLINK network.

3. FUNCTION OVERVIEW

3.1 WEB SERVER FUNCTION OVERVIEW

The “WEB Server functions” mean functions as a WEB server from the WEB browser’s point of view. The Table 3.1 shows the list of the WEB functions of the SC-WGW-AR Gateway.

Table 3.1 List of the WEB Server Functions (List of Screens)

WEB Function (Screen)	Content
Login	Authentication of the user by the UserID and Password.
Overview Monitor	Display the overall status of all CELLS of the whole PAC system without scroll of the screen.
Individual Monitor	Display the detail status of each CELL in the pop up window.
Control Command	Input Control command to CELLS by the array of pull down menus.
System Stop	Stop all the CELLS and set the remote controller reject mode by one click.
PAC Configuration	Set the full room name and the short name for each CELL. These names to appear on the Monitor screen.
Config. File Transfer	Upload and Download of the PAC Information CSV file which defines the indoor unit grouping of the CELLS.
Communication / buzzer Config.	Set the browser’s auto-refresh interval of the Overview Monitor screen. Set the alarm buzzer On/Off.
Link Config.	Set the link another WEB Gateway.
Security Config.	Set the accessible IP address of a PC, that is IP address filtering.
Password Change	Password can be changed from this screen.
Calendar Config.	Set the yearly calendar defining each day as “Weekday”, “Holiday”, etc This yearly calendar is common to all CELLS.
Master Schedule Config.	The Master Schedules are default daily operation schedules depending on a day of a week or a special day. Set each Master Schedule of a CELL. Each CELL has a different default daily schedule.
Schedule Control	Set temporarily alternation to the daily operation schedule of a CELL for maximum 7 days from the current day. The temporary alternation does not affect the Master Schedule.
Calendar/Schedule Backup File Transfer	Makes a schedule/calendar backup file and downloads/uploads the file.
Date Time Set	Adjust the date and time of the WEB server.
NTP Config.	Set the NTP server synchronizing the time.

* “CELL” is a group of the indoor units connected by one remocon, or an indoor unit. A remocon is a packaged air-conditioner’s remote controller.

3.2 CONTROL & MONITOR FUNCTION OVERVIEW

The control and monitor functions mean categories of jobs from an air-conditioning system's point of view. The Table 3.2 shows the control and monitor functions of the SC-WGW-AR Gateway.

Table 3.2 List of Control & Monitor Functions of the SC-WGW-AR

	Function	Content
C O N T R O L	On/Off command	Send the On/Off command to a CELL.
	Mode command	Send the operation mode command (Auto, Cooling, Dry, Heating, Fan) to a CELL.
	Setpoint command	Send the temperature setpoint command to a CELL. The range is from 18 to 30 degrees Celsius.
	Fan Speed command	Send the fan speed select command (Hi, Me, Lo) to a CELL.
	Remocon Lock/Unlock command	Send the remote controller operation Lock or Unlock command to a CELL.
	Filter Sign Reset command	Send the reset command for the filter sign on the remote controller of a CELL.
M O N I T O R	System Stop command	Send the Off commands to all CELLS and set all CELLS as the Remocon Lock mode simultaneously.
	Failure status	Monitor the failure status LED on/off on the remote controller for a CELL.
	On/Off status	Monitor the On/Off status of a CELL.
	Mode status	Monitor the operation mode status of a CELL .
	Setpoint status	Monitor the setpoint status of a CELL
	Fan Speed status	Monitor the fan speed select status of a CELL.
	Remocon Lock/Unlock status	Monitor the setting of the remote controller Lock/Unlock mode of a CELL.
	Filter Sign status	Monitor the status of the filter sign LED on the remote controller of a CELL.
Room Temperature Status	Monitor the room temperature sensor data of a CELL.	

* A "CELL" is a group of the indoor units connected by one remocon, or an indoor unit.

4. HARDWARE SPECIFICATIONS

(1) Power Supply

- AC single phase 100V - 240V +10%, -15% 50/60Hz

(2) Operation Temperature

- Ambient Temperature : 0 to 40 degrees Celsius
- Relative Humidity : Max 85 %RH (without dewing)

(3) Storage Temperature

- Ambient Temperature : -10 to 50 degrees Celsius
- Relative Humidity : Max 85 %RH (After 48 hours from out of storage, dewing should not exists)

(4) Power Blackout Compensation

- This Gateway does not have a battery circuit for power blackout recovery.
- If blackout or manual power off occurs for more than 30 msec, the monitoring data and the setting of each CELL (indoor unit), such as the operation mode or set point temperature, may disappear.
- This Gateway periodically writes the monitoring data of the CELLS to the non-volatile memory at every 24 hours. If the power supply is cut off, at the worst case, the monitoring data of 24 hours before that time will be stored. The stored settings are automatically recovered when this Gateway is restarted
- This Gateway does not store and recover the On/Off control settings. However, depending on the setting of the remote controller, indoor units will restart when the power supplies to the whole air-conditioner system resume to normal state.

(3) Appearance

- Outline drawing : Fig 4.1 on the following page
- Outline dimensions : 260(W) x 200(H) x 79(D) mm
- Color : Black

5. INSTALLATION

5.1 INSTALLATION CONDITIONS

This Gateway SC-WGW-AR has a terminal block for the AC power supply on the outside surface of the casing.

For avoiding electrical shock injury, the SC-WGW-AR should be installed inside a cabinet with a lock

The direction of placement of this Gateway when installation should be such a way that the front panel is vertical and the lettering of the front panel is right direction because of air-cooling.

The recommended service space surrounding this Gateway is as follows:

- Upper clearance : Minimum 30 mm
- Lower clearance : Minimum 30 mm
- Right side clearance : Minimum 50 mm (more than 200 mm is recommended)
- Left side clearance : Minimum 50 mm (more than 200 mm is recommended)

The side clearance is for wiring workspace.

5.2 WIRING

The Fig 5.2 shows the wiring of this Gateway. After wiring to the WEB Gateway, the terminal covers, which are included in this Gateway's product package, should be installed by screws as shown in the Fig 4.1. After wiring work finished, fix the terminal covers securely by the screws

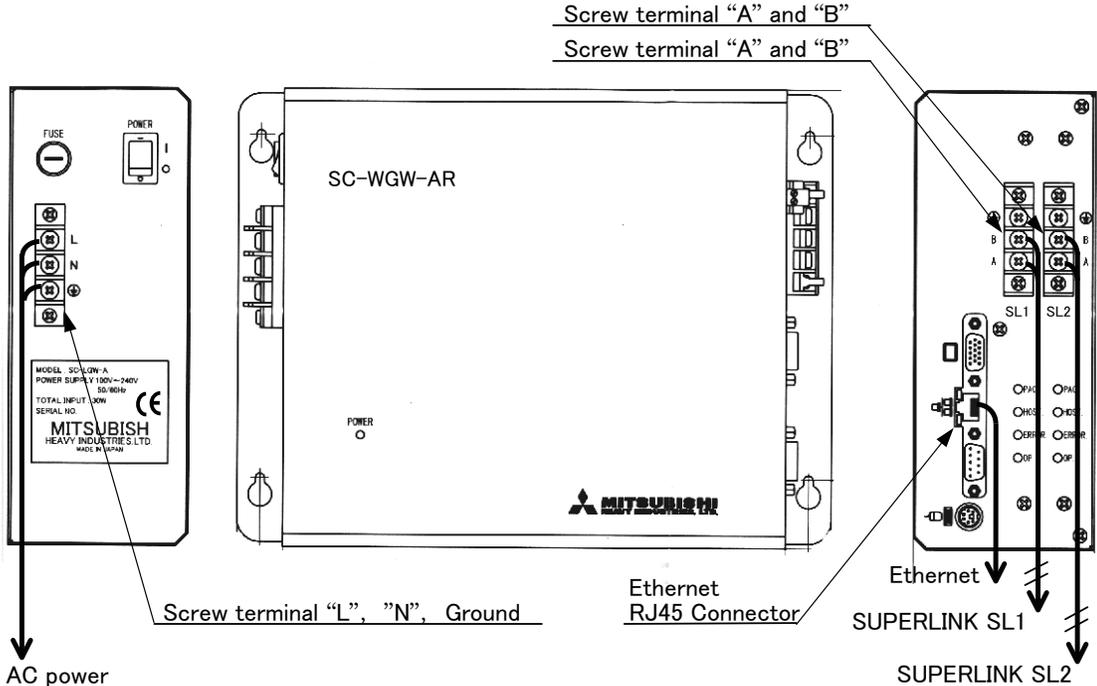


Fig. 5.1 SC-WGW-AR Wiring

5.3 ETHERNET CABLE

This Gateway supports the Ethernet 10BASE-T or 100BASE-TX which are most popular among the standards of the Ethernet. In the case of only one PC is used for control and monitor, the PC and the Gateway can be connected directly by a cross Ethernet cable. The cross cable is a kind of Ethernet cable which connects two computers directly. In the case of using more than one PCs for control and monitor, an Ethernet HUB must be used. For both cases, the category 5 cable grade or higher must be used.

Materials for wiring the Ethernet, such as cables or HUBs, are not included this Gateway's product package. The type of the HUB may be ordinary office LAN use.

5.4 SUPERLINK CABLE

This Gateway supports the SUPERLINK control network. The recommended specifications of the cable for the SUPERLINK are shown as follows;

- (1) Size of cable : 0.75 to 2.0 square mm
- (2) Max length of wiring : 1000m/channel (loop wiring is not allowed)
- (3) Cable materials :

Twisted Vinyl Cabtyre Cable	V C T F	2 core	0.75 to 2.0 square mm
Twisted Vinyl Cabtyre Cable	V C T	2 core	0.75 to 2.0 square mm
Twisted Vinyl Cable for Control	C V V	2 core	0.75 to 2.0 square mm

- (4) For prevention of electromagnetic noise malfunctions, parallel wiring with the power line should be avoided.

6. WEB SERVER FUNCTIONS

The “WEB server functions” mean screen making functions of the Internet Explorer on the PCs which are connected with the SC-WGW-AR Gateway.

6.1 LOGIN SCREEN

In order to login to the WEB server of this Gateway, input the following URL into the WEB browser, that is, the Internet Explorer on the control and monitor PC.

- WEB server URL : **http://192.168.0.110/en/**

The default IP address which is set at the shipment is 192.168.0.110. In case that the IP address has been changed, the new IP address should replace with the default IP address of 192.168.0.110.

This screen of the SC-WGW-AR Gateway is for user authentication. This Gateway defines the following three categories of user operation rights.

- (1) Administrator User
- (2) Control User
- (3) Monitor User

The first category of the users has the all administration rights of the WEB server, control rights and monitor rights of the system. The second category of the users has the control and monitor rights of the system. The third category of the users has the monitor rights only. In other words, PCs for this Gateway system are categorized by the PC users of the above-mentioned categories.

The UserID and the Password can be changed in the Password change screen that will be mentioned later in this document. The default UserIDs and Passwords are set when factory shipment as follows:

- | | | |
|------------------------|-------------------------------|-----------------------------------|
| (1) Administrator User | (User ID : Admin , | Default Password: 123456) |
| (2) Control User | (User ID : Controler , | Default Password: 123456) |
| (3) Monitor User | (User ID : User , | Default Password: 123456) |

In case that more than one WEB Gateways are linked by the Communication Configuration written in the clause 6.9 of this document, the name of the WEB Gateway which an operator now tries to log in is displayed at the center of this screen.

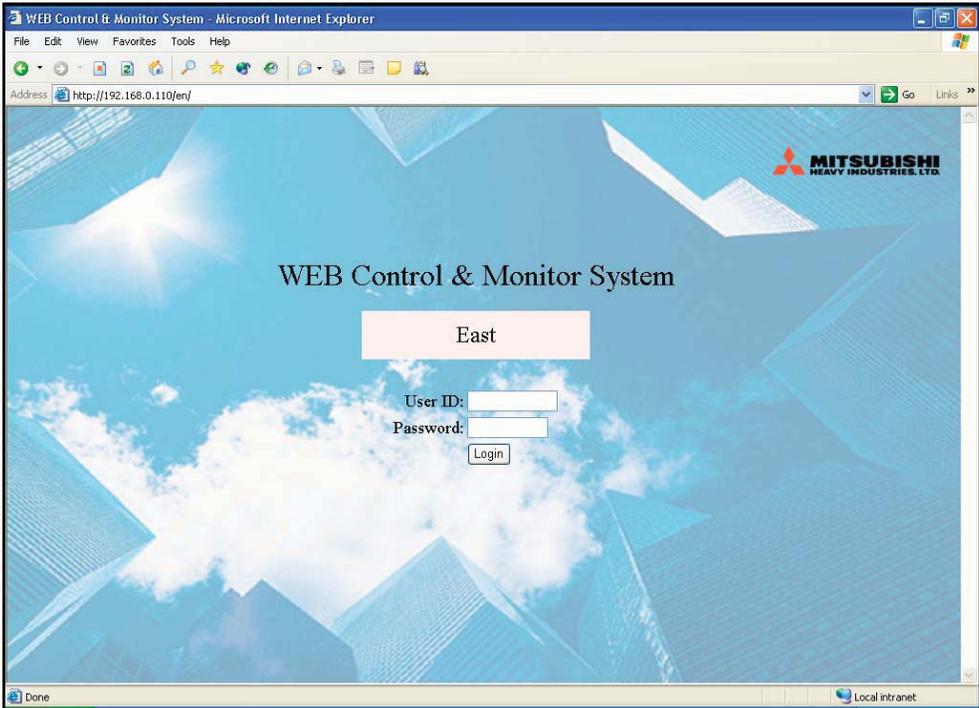


Fig. 6.1 LOGIN SCREEN

6.2 OVERVIEW MONITOR SCREEN

This screen is for monitoring the overview of the whole PAC system on the one screen. The short names for the installation place, On/Off/OperationMode status icons, and Failure status icons of up to 96 CELLS are displayed as an array on this screen. The whole status information can be displayed without scroll manipulation if the Internet Explorer widow size is set to larger than 1024 by 768 pixels.

The length of the character string for the short name for a CELL is up to 16 characters. The character string indicates place of the CELL, for example, "ROOM123" or "2F_EAST". The character string can be input on the PAC information configuration screen that will be explained later.

This Overview Monitor screen will appear immediately after the login, and supposed to be the home screen of the WEB server while the Gateway is running. This screen has the links to other screens of "Control Command screen", "System Stop screen" and "Configuration Menu screen". By clicking each screen link, each corresponding screen will appear. This Overview Monitor screen also indicates the System Off status by replacing the MITSUBISHI HEAVY Industries' logo by the System Stop status indication.

The Overview Monitor screen is refreshed automatically by the interval of the reload period that can be configured from 1 second to 60 seconds. Normally it takes less than 1 second to refresh the Overview Monitor screen. But, it may take several seconds to refresh the Overview Monitor screen depending on the Ethernet environment and other factors. When refreshing the screen, contents of the screen may blink because of the Internet Explorer's intrinsic characteristic.

This Gateway detects status changes of packaged air-conditioners by the SUPERLINK broadcast communication packets from indoor units. The Gateway inquires status change to every indoor unit at the 1-minute interval as a backup for a case that the Gateway fails to receive the status change broadcast. In a rare case, the status change of a CELL on the Overview Monitor screen might delay up to 1 minute.

In case that more than one WEB Gateways are linked by the Communication Configuration written in the clause 6.9 of this document, gateways are displayed like a tab menu. The user can switch the screen to the corresponding screen of another WEB Gateway by clicking the link name.

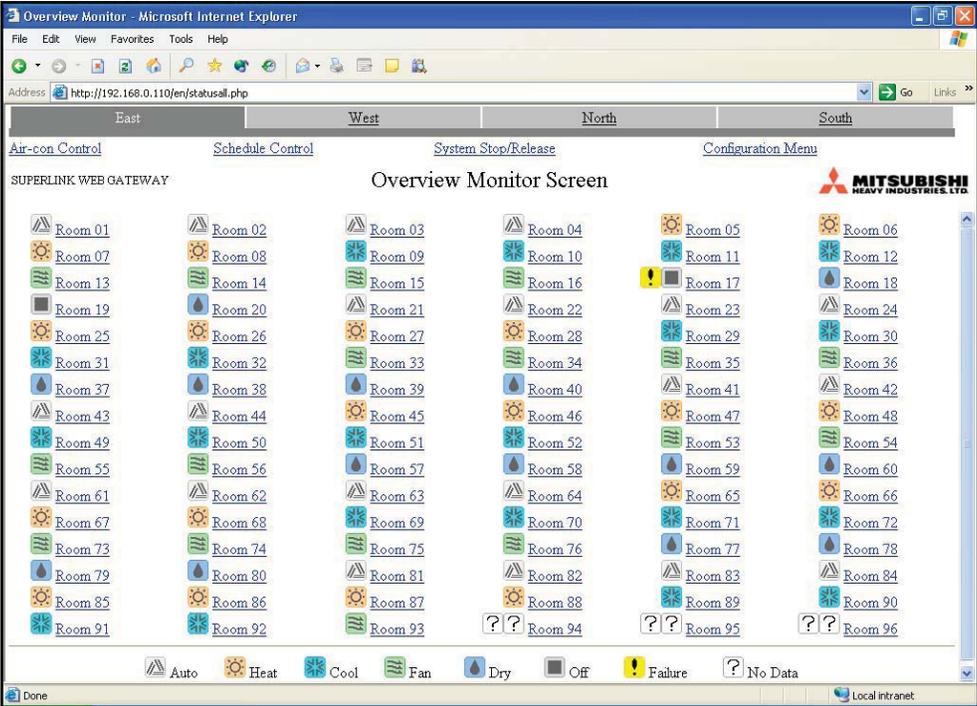


Fig. 6.2.1 OVERVIEW MONITOR SCREEN

In case that the Alarm buzzer setting is ON as described in the clause 6.8 COMMUNICATION CONFIGURATION SCREEN, the web browser will sound the alarm buzzer when a air-conditioner failure stop occurs. The volume of the buzzer is adjusted by the web browsing PC's volume setting. The content of the alarm buzzer will not be customized.

The alarm buzzer goes not only at the overview monitor screen, but also all other screens. While this buzzer is sounding, the MHT's logo on the upper right corner of the screen will be replaced by the red buzzer stop button. By clicking this button, all browser PC's buzzer will cease. However, this operation does not reset the failure mode of the actual air-conditioner. This alarm buzzer will be stoped by resetting failure stop by a remote controller or an option controller such as SLA2A.

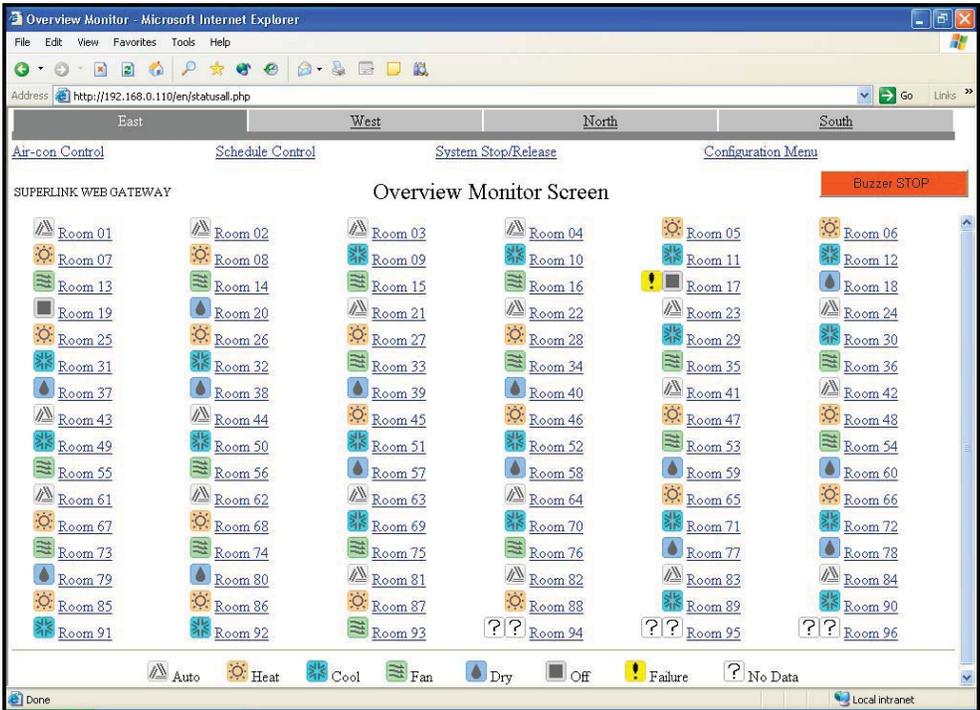


Fig. 6.2.2 ALARM BUZZER STOP BUTTON

6.3 INDIVIDUAL MONITOR SCREEN

This screen is for indicating the detail information on one of the CELLS by the pop up window in front of the above-mentioned Overview Monitor screen. The items of monitoring information are the place short name, the place description, the On/Off/Mode icon, the setpoint, the room temperature, the remoco lock/unlock status, the filter sign status, and the error code of the selected CELL.

By clicking a short place name for a CELL on the Overview Monitor screen, the corresponding Individual Monitor window will pop up in front of the Overview Monitor screen. If another Individual Monitor window is opened, it will pop up the same place on the screen, and consequently the previous Individual Monitor window will disappear.

Both the Individual Monitor window and the Overview Monitor screen automatically refresh themselves at the same interval set in the Communication Configuration screen. It may take several seconds to refresh an Individual Monitor window of a CELL depending on the network situation. Even in the case that a Failure status icon comes on behind the Individual Monitor window, the Failure icon does not move to the front of the Individual Monitor window. Therefore, if an Individual Monitor window is left opened for a long time, some part of the Overview Monitor screen lose a chance to notify changes of status for the packaged air-conditioners.

This Gateway detects status changes of packaged air-conditioners by the SUPERLINK broadcast communication packets from indoor units. The Gateway inquires status changes to every indoor unit at the 1 minute interval as a backup for a case that the Gateway fails to receive the status change broadcast. In a rare case, the status change of a CELL on the Individual Monitor screen might delay up to 1 minute.

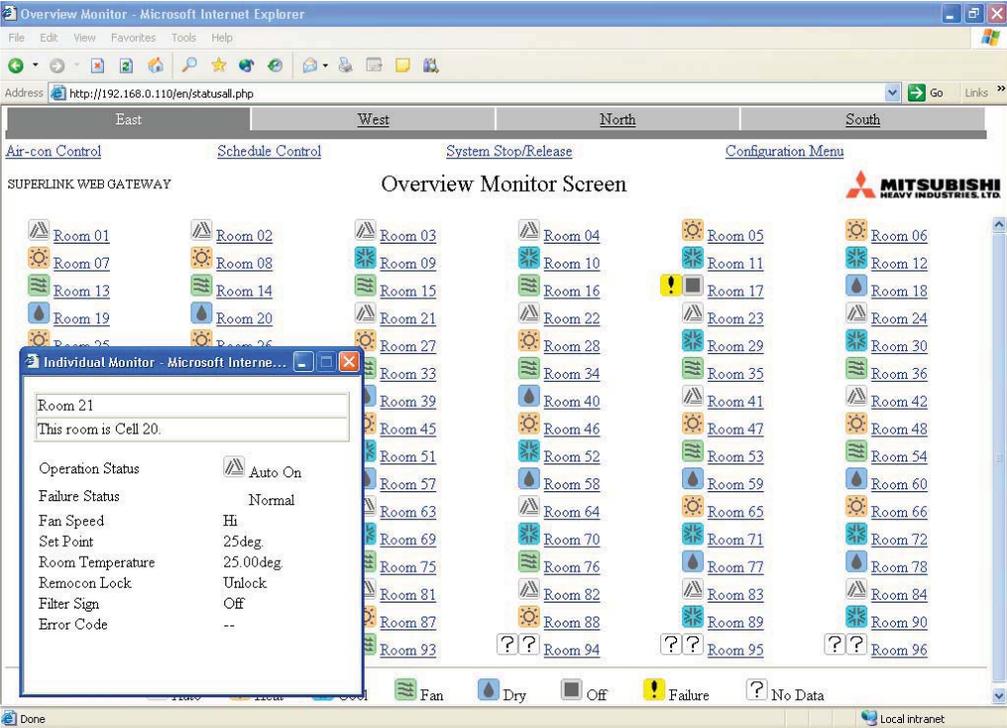


Fig. 6. INDIVIDUAL MONITOR SCREEN

6.4 CONTROL COMMAND SCREEN

The Control Command screen is for control input operation to each CELL. This screen can be accessed by the Administrator User or the Controller User as mentioned above. The Monitor User can not access to this screen. By clicking the link name character string for this screen on the Overview Monitor screen, this Control Command screen will appear.

Normally it takes several seconds to compose the Control Command screen. But, it may take more time depending on the Ethernet network environment and other factors.

Each control item of each CELL has the pull-down menu in the Control Command screen. Selecting control values from the pull-down menu one by one, then clicking the "Send" button dispatches all the selected command values to the CELLS at once. When this screen is opened, the status value indicated in each pull-down menu is the current status for each CELL. However these status values are not updated during this Control Command screen is opened. That is, the status values will not be changed even if a Failure occurs.

As mentioned above, linked WEB Gateway names displayed like a tab menu on the first line of the screen.

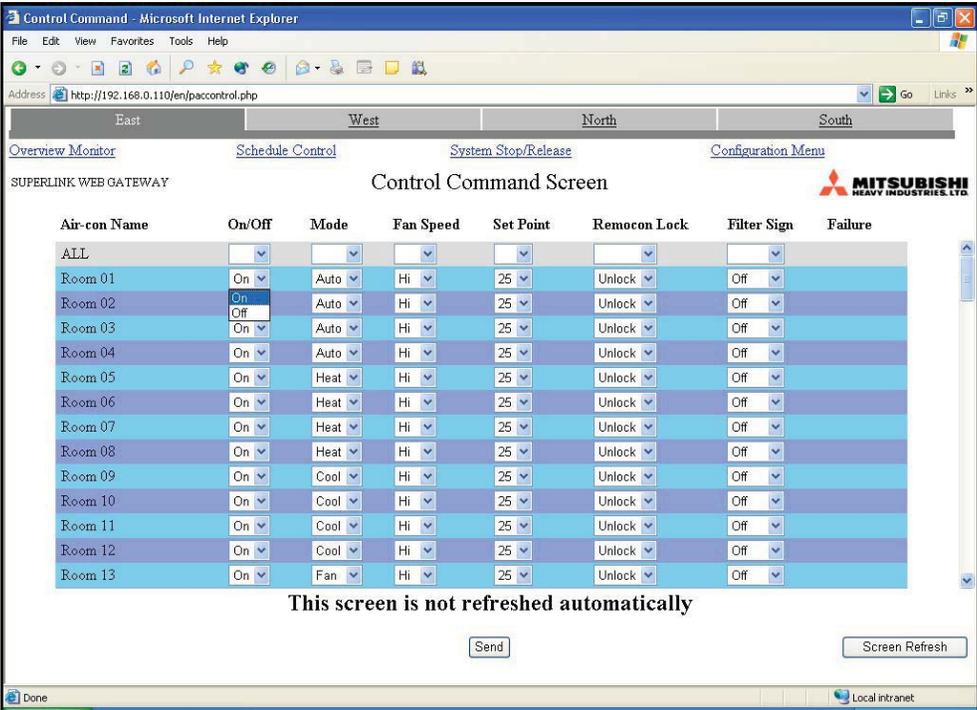


Fig. 6.4 CONTROL COMMAND SCREEN

6.5 SYSTEM STOP SCREEN

The System stop screen is for controlling the System Stop/Release function of this Gateway. The Administrator and the Controller User can access to this screen. By clicking the System Stop/Release button, the Gateway automatically sends the Off commands and the Remocon Lock commands to all the CELL at once. Consequently, all the indoor units under this Gateway immediately stop and set as the Remocon Lock mode. By clicking the Release button on this screen, all the indoor units are released to resume the Remocon Unlock mode.

In case that the optional SUPERLINK controller such as SLA-1 or SLA-2A is also connected, the above mentioned Remocon Lock command will be overridden by the optional SUPERLINK controller's remocon lock/unlock setting. Therefore, this System Stop/Release function is not recommended to use with optional controllers.

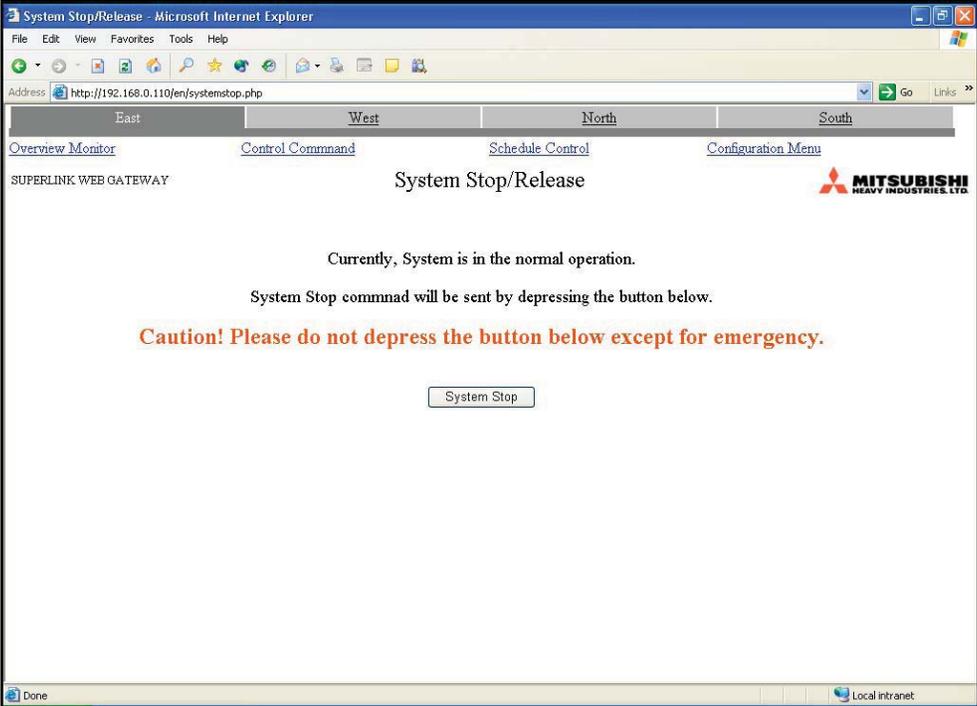


Fig. 6.5 SYSTEM STOP SCREEN

6.6 PAC CONFIGURATION SCREEN

This screen is for setting the place name and the short place name for each CELL. This screen can be reached from the Configuration menu screen which is linked from the Overview monitor screen. Only the Administrator User is able to access to this screen.

This screen shows the table of the CELL number, the SUPERLINK channel number, the SUPERLINK address of the indoor unit, the input box for the place name, and the input box for the short place name for the CELL. The Administrator can input a character string such as "ROOM123 on the 5th Floor" for the place name of the CELL, and also "ROOM123" the short place name. These names are automatically copied to the PACinfo.csv file for the PAC configuration file Upload/Download function.

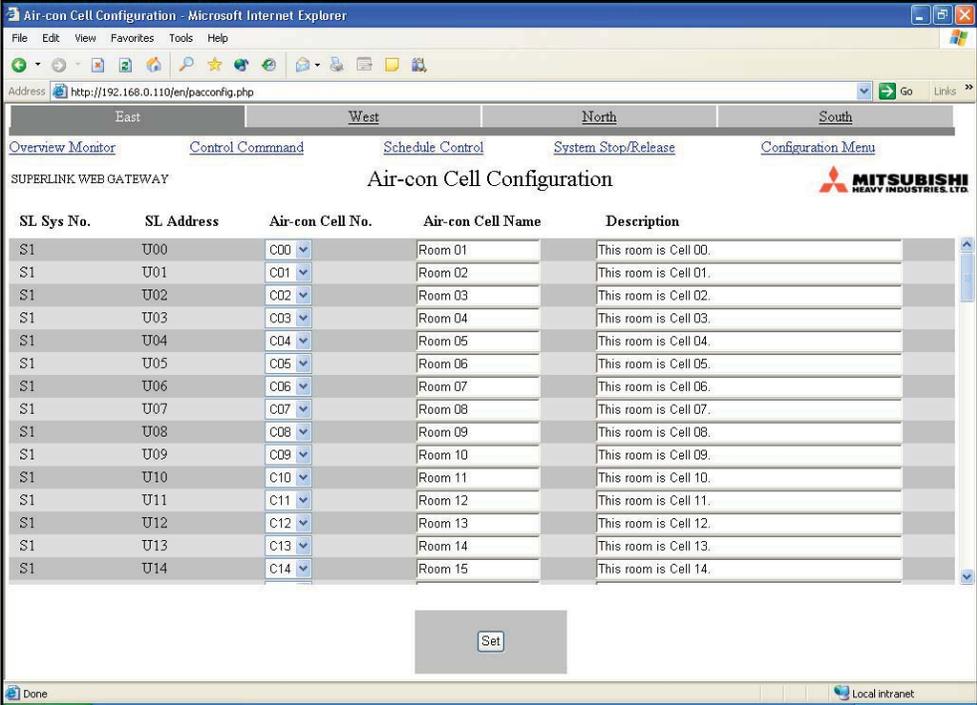


Fig. 6.6 PAC CONFIGURATION SCREEN

6.7 CONFIG FILE TRANSFER SCREEN

This screen controls upload and download of the “PACinfo.csv” file which is a configuration file for the CELLS for packaged air-conditioners. The file is the list of CELL definitions, that is the comma separated values of the CELL numbers, the SUPERLINK channels, and the indoor unit numbers, the place names, and the short place names.

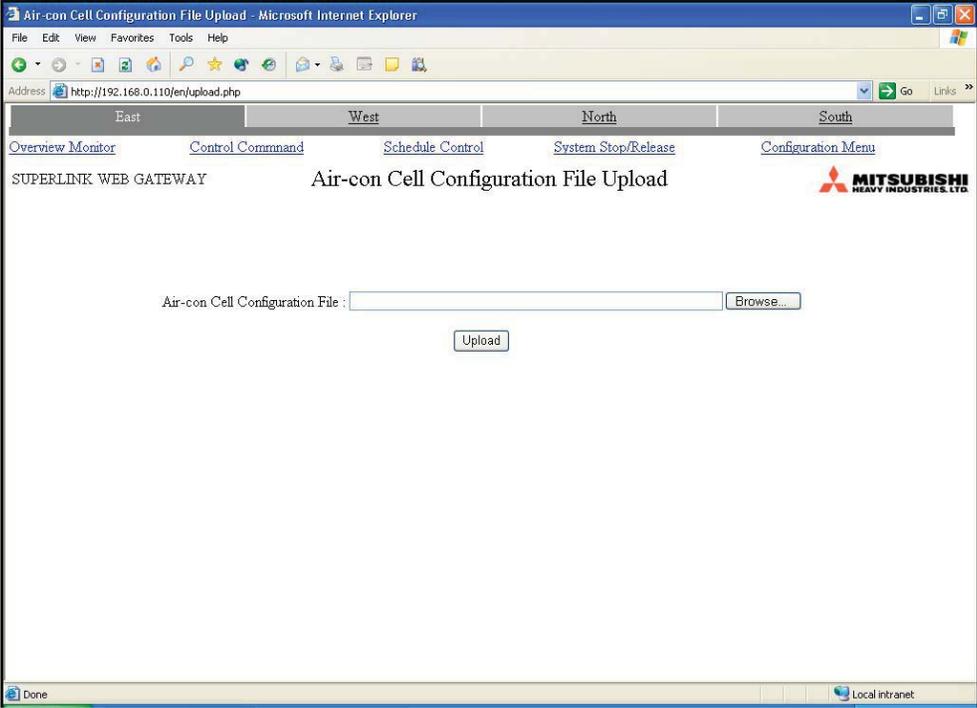


Fig. 6.7 CONFIG FILE TRANSFER SCREEN

6.8 COMMUNICATION CONFIGURATION SCREEN

This screen configures the interval time of the WEB browser's screen refresh rate. Only the Administrator User can access to this screen. The refresh interval time can be set from 1 second to 60 seconds. At the factory shipment, the interval has been set to 10 seconds.

The IP address and subnet mask of this gateway can be changed from this screen. The gateway will be automatically rebooted if IP address and subnet mask have been changed. There is "Buzzer ON" check box in this screen. By checking this box, web browser PC(s) sound(s) the Alarm buzzer when an air-conditioner's failure stop occurs.

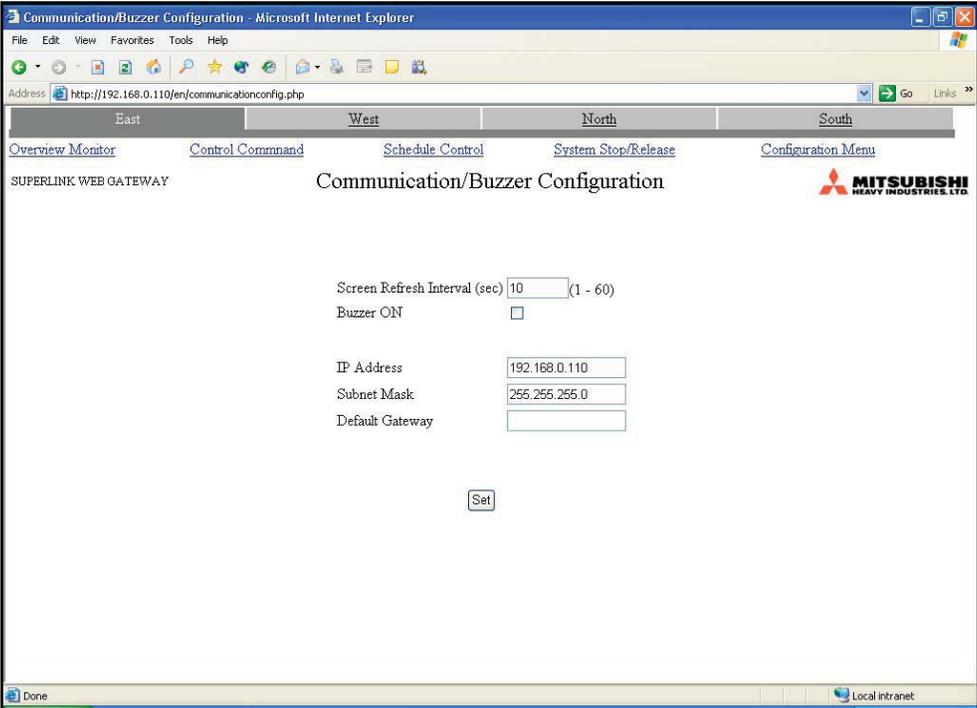


Fig. 6.8 COMMUNICATION CONFIGURATION SCREEN

6.9 LINK CONFIGURATION SCREEN

This screen configures the linkage with other WEB Gateways. Only the Administrator User can access to this screen. In case that more than one WEB Gateways are linked each other, the Link Names for other Gateways should be input in this screen. The IP addresses of the linked WEB Gateways also have to be registered in the IP Address input columns of this screen.

The position of a input column determines the position of the Linked Name Tab on top of other screens. By clicking a Link Name Tab, the current screen will be switched to the corresponding screen of the other linked WEB Gateway.

This WEB Gateway recognizes the input name as its own Link Name when the input IP address matches its own IP address. Then its own Link Name Tab is displayed with dark gray.

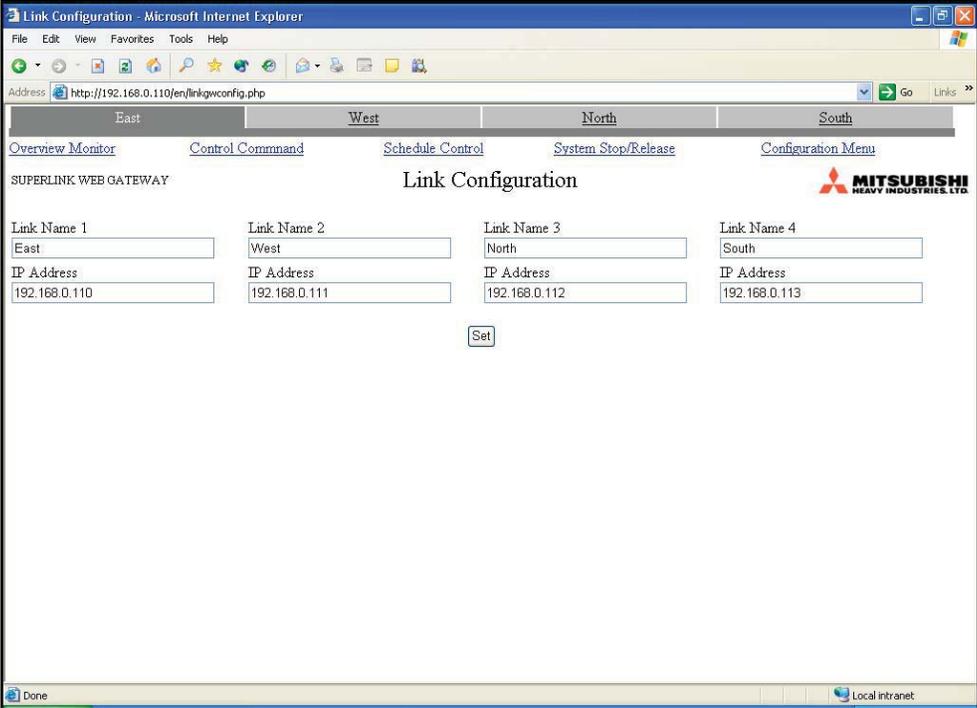


Fig. 6.9 LINK CONFIGURATION SCREEN

6.10 SECURITY CONFIGURATION SCREEN

This is the screen in which the IP address filtering can be set. This screen can be accessed only by the Administrator User. By input one or more IP addresses to the input dialog box of this screen, the only PCs with this IP address can become the WEB browser for this Gateway.

In the default state, none of the IP addresses have been set in this screen. This means the IP address filter has not been set, that is, any PC with any IP address can become a WEB browser of this Gateway.

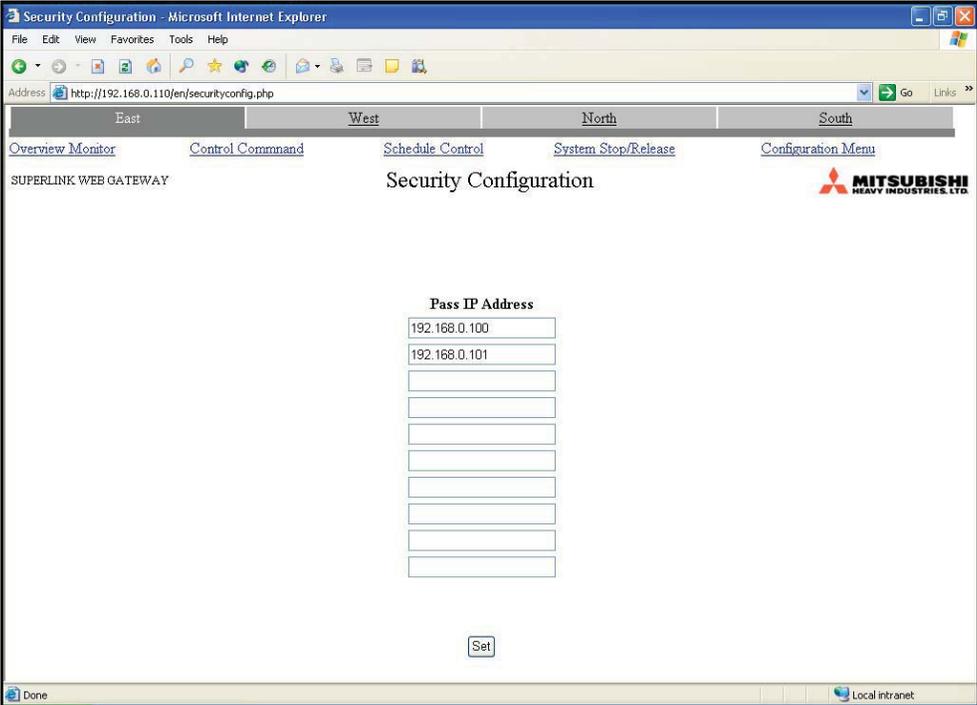


Fig. 6.10 SECURITY CONFIGURATION SCREEN

6.11 PASSWORD CHANGE SCREEN

This screen is for change the passwords for login to this Gateway. The Administrator can access to this screen by the separated secret URL. There is no WEB link from any above-mentioned screen to this secret screen.

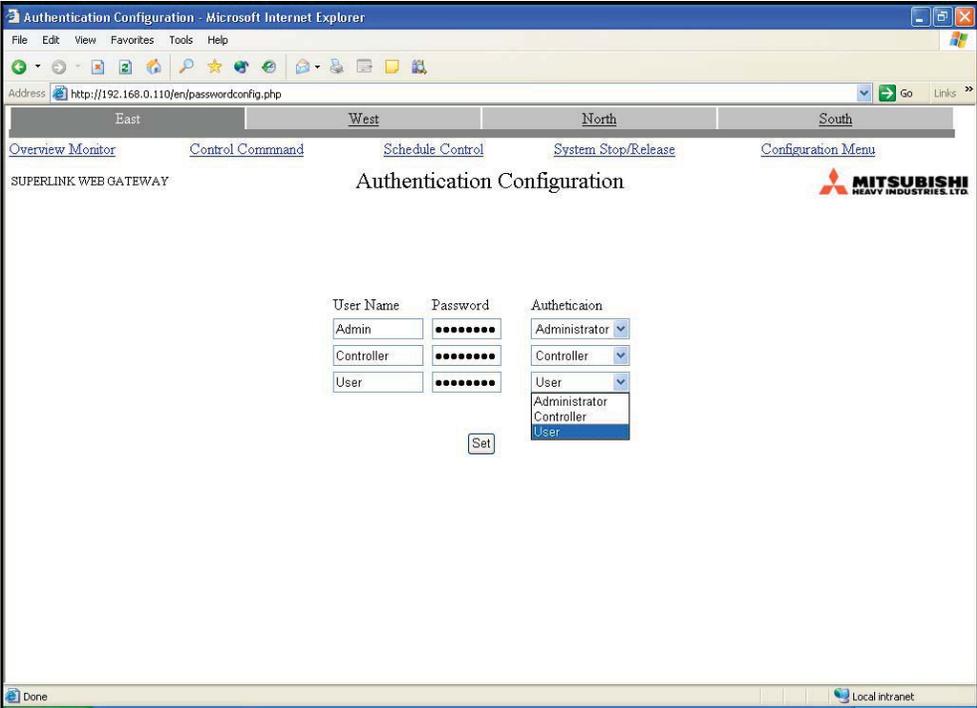


Fig. 6.11 PASSWORD CHANGE SCREEN

6.12 CALENDAR CONFIGURATION SCREEN

This screen is for setting yearly calendar of this WEB Gateway. This screen can be reached from the Configuration Menu screen. Only the Administrator User can get into this screen.

At first, the current month's calendar will appear. The calendar of a specific month will appear by selecting a month from the "Select Month" pull-down menu. Time for composing the screen will depend on the network environment and other factors. The Administrator can set each day as "Weekday", "Holiday", "Special 1" or "Special 2".

For a "Weekday", the daily operation schedule corresponding day of the week will be related to the date of this yearly calendar. For a "Holiday", a "Special 1" or a "Special 2", the corresponding daily operation schedule will be related to the date. After editing a specific month, the setting will be stored by clicking "Set" button. In case that the "Undo" button clicked before clicking "Set", edited contents will disappear.

This Gateway has only one yearly calendar which is common to all CELLS. The setting for this yearly calendar will be memorized even in the case of power-off. This yearly calendar does not distinguish the year, therefore, the setting can be used in the following years.

In case that more than one WEB Gateways are linked, this yearly calendar should be set for each Gateway. By clicking the linked Gateway name on the first line of the screen, the corresponding yearly calendar will appear.

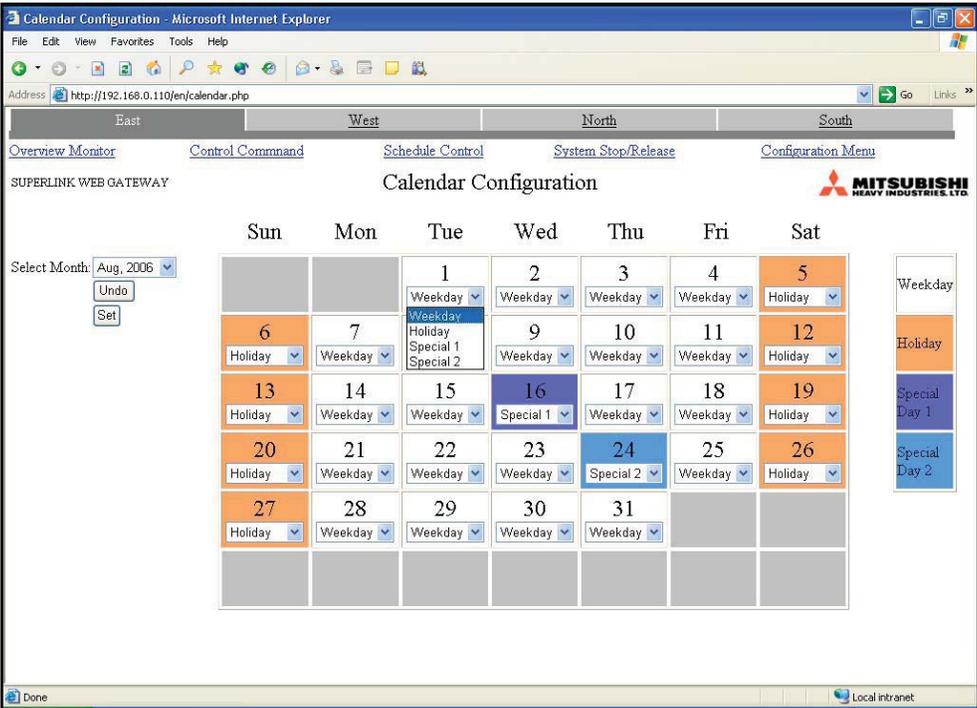


Fig. 6.12 CALENDAR CONFIGURATION SCREEN

6.13 MASTER SCHEDULE CONFIGURATION SCREEN

This screen is for setting the “Master Schedule” of each CELL. A “Master Schedule” is the name of the daily operation schedule which is mentioned in the previous page. This screen can be reached from the Configuration Menu screen. Only the Administrator User can get into this screen.

A “Master Schedule” is a default day operation schedule of a specific CELL. Each CELL can have up to 10 Master Schedules corresponding to the day category, that is, (Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday, Holiday, Specialday1 and Specialday2). The CELL operation will be scheduled by this Master Schedule unless temporarily modified by the Schedule Control function.

At first, the Master Schedule configuration screen for the smallest CELL No will appear. The specific Master Schedule will appear by selecting the CELL from the “Air-con CELL” pull-down menu and the day category by the “Select Date” pull-down menu.

The schedule items and acceptable values are the followings:

Item	Value
On/Off	Blank(No operation), On, Off
Mode	Blank(No operation), Auto, Heat, Cool, Fan, Dry
Fan Speed	Blank(No operation), Hi, Me, Lo
Set Temperature	Blank(No operation), 18, 19,....., 29, 30 deg. Celsius.
Remocon Lock	Blank(No operation), Lock, Unlock

The combination of up to 5 items, that is, (On/Off, Mode, FanSpeed, SetTemperature, RemoconLock), can be scheduled for each schedule time. The total number of the schedule items multiplied by the schedule times should be less than 20 for one screen.

The edited schedule data in this screen will be stored by clicking the “Set” button. The edited schedule data will be cancelled by clicking the “Undo” button. Also, the data can be copied to that of another CELL by clicking the “Copy” button.

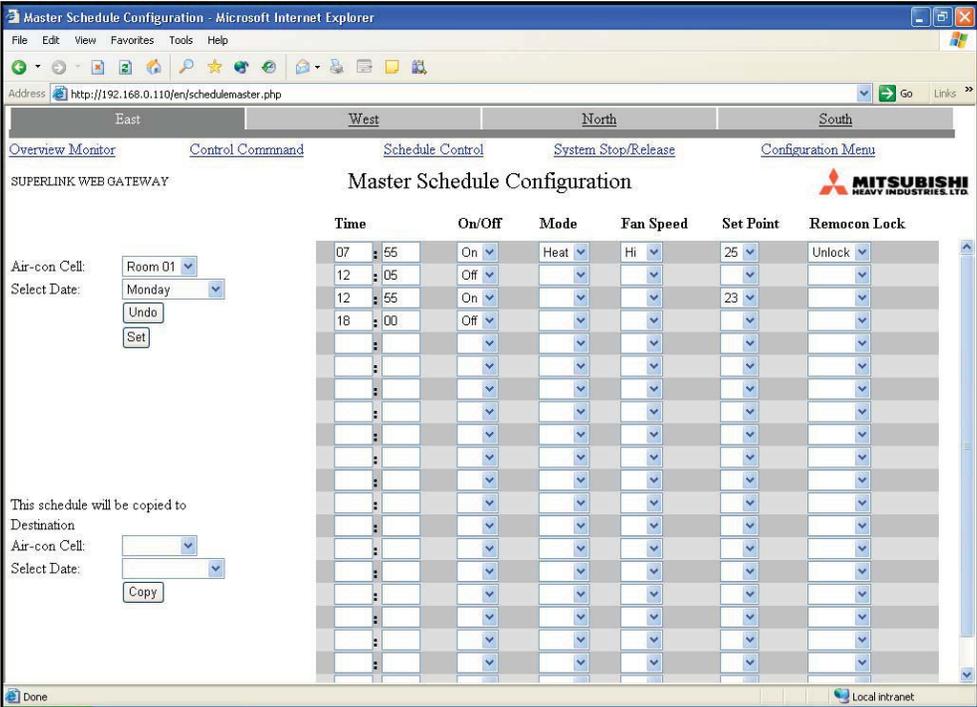


Fig. 6.13 MASTER SCHEDULE CONFIGURATION SCREEN

6.14 SCHEDULE CONTROL SCREEN

This screen is for temporary alternation of the Master Schedule of each CELL. This screen can be reached from the home page of this WEB server, that is, the Overview Monitor screen. Not only the Administrator user but also the Controller user can get into this screen.

At first, the today's Schedule Control screen for the smallest number CELL will appear. The specific Schedule Control screen will appear by selecting the CELL from the "Air-con CELL" pull-down menu and the date from the "Schedule Date" pull-down menu which consists 7 days from today. The default schedule is same as the Master Schedule. The user can temporarily change the daily operation schedule of the CELL without influencing on the corresponding Master Schedule.

The schedule items and acceptable values are the followings:

Item	Value
On/Off	Blank(No operation), On, Off
Mode	Blank(No operation), Auto, Heat, Cool, Fan, Dry
Fan Speed	Blank(No operation), Hi, Me, Lo
Set Temperature	Blank(No operation), 18, 19,....., 29, 30 deg. Celsius.
Remocon Lock	Blank(No operation), Lock, Unlock

The combination of up to 5 items, that is, (On/Off, Mode, FanSpeed, SetTemperature, RemoconLock), can be scheduled for each schedule time. The total number of the schedule items multiplied by the schedule times should be less than 20 for one screen.

The edited schedule data in this screen will be stored by clicking the "Set" button. The edited schedule data will be cancelled by clicking the "Undo" button. Also, the data can be copied to that of another CELL by clicking the "Copy" button.

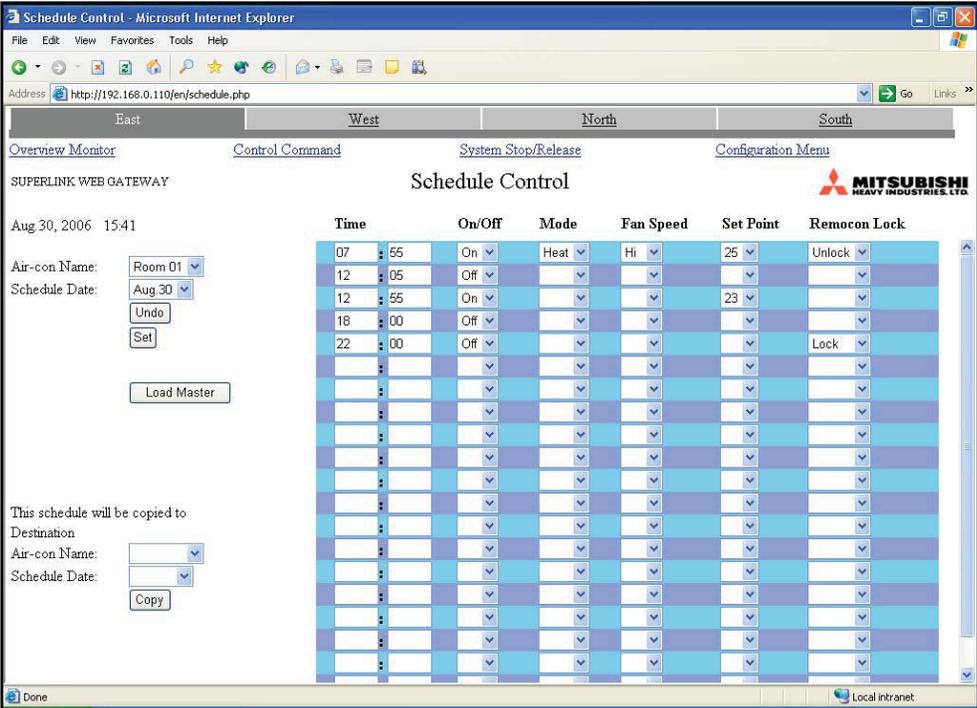


Fig. 6.14 SCHEDULE CONTROL SCREEN

6.15 CALENDAR/SCHEDULE DATA BACKUP SCREEN

The calendar/schedule data can be backed up as a compressed binary data file by this screen. The both data will be compressed into a "tgz" type file and downloaded automatically from the Calendar/Schedule Backup File Download screen. In the case of restoring the backup file to the SC-WGW-AR again, the file can be uploaded by the Calendar/Schedule Backup File Upload screen as shown in below. Immediately after uploading the backup file, the gateway will reboot automatically and make the backup file in effect.

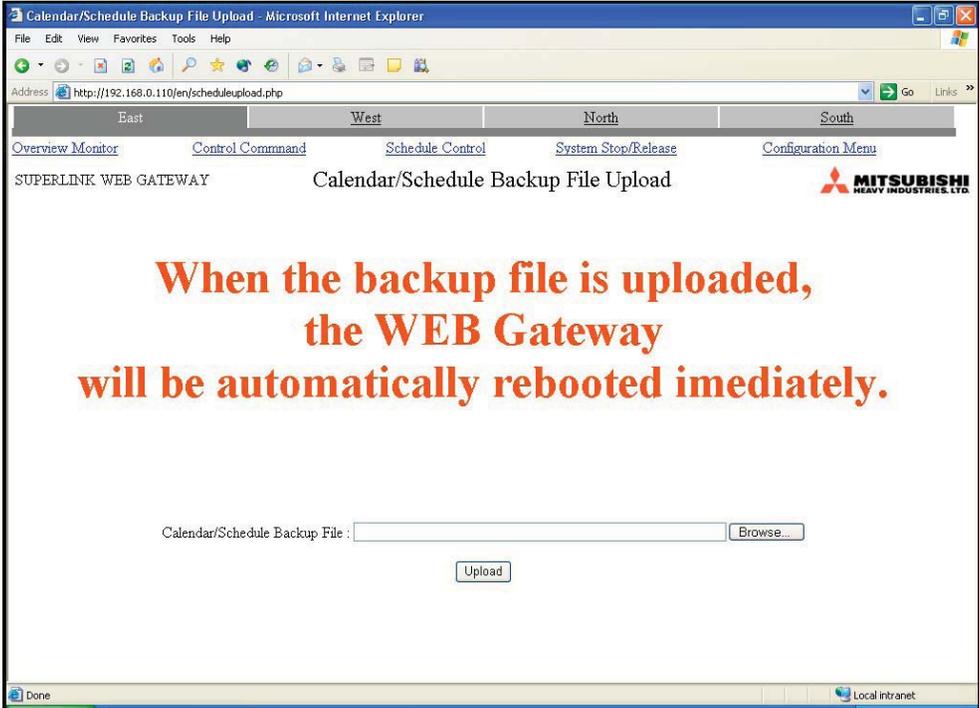


Fig. 6.15 CALENDAR/SCHEDULE BACKUP FILE UPLOAD SCREEN

6.16 DATE TIME SET SCREEN

This screen is for setting the current Date and Time for the WEB server. This Date and Time is for WEB server, instead of the PC's operating system date and time. This screen can be reached from the Configuration Menu screen. Only the Administrator user can get into this screen.

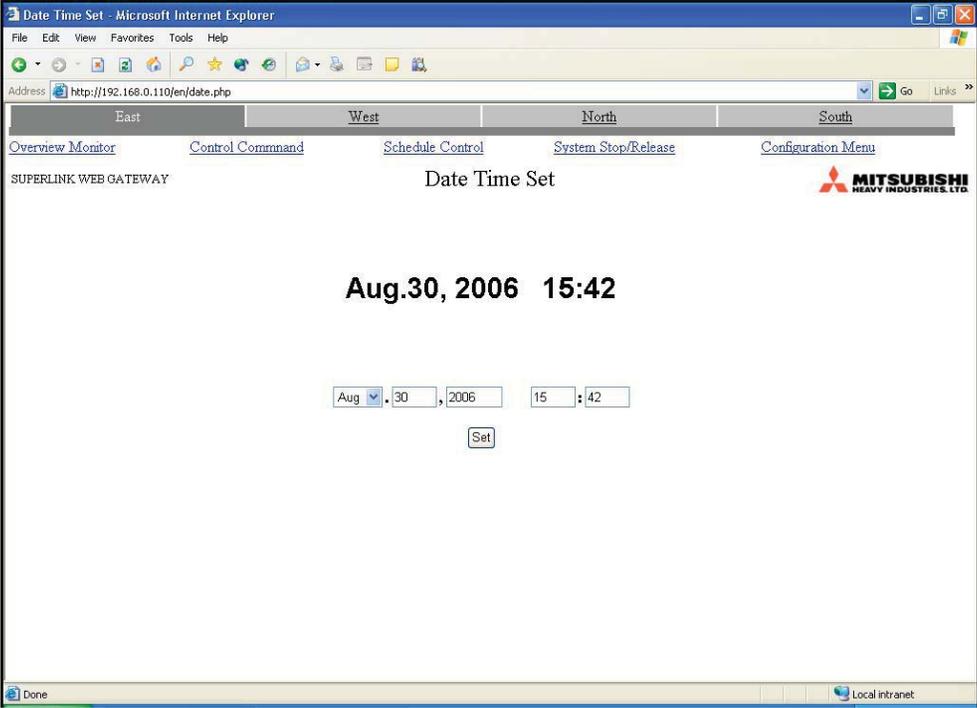


Fig. 6.16 DATE TIME SET SCREEN

6.17 NTP CONFIGURATION SCREEN

This screen is for setting the automatic synchronization to an NTP time server for the WEB gateway's clock. Only the Administrator User can access to this screen.

The IP address of the NTPtime server is input to the IP address column of this screen, and the desired time difference with UTC time should be set. The time difference can set the range from minus 11 hours and 45 minutes to plus 14 hours and 45 minutes at intervals of 15 minutes.

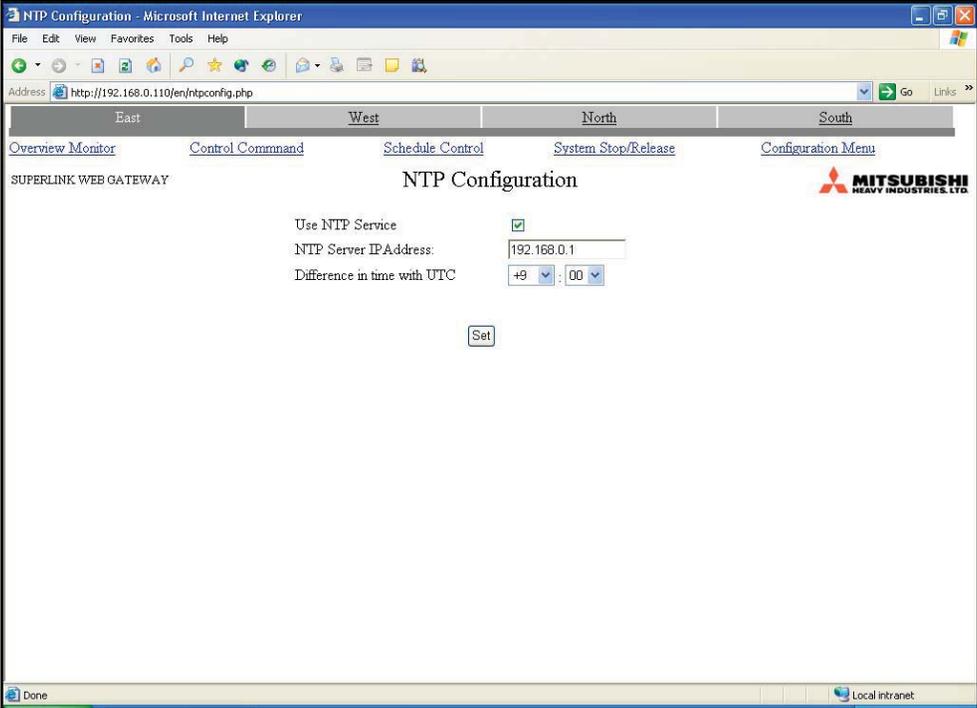


Fig. 6.17 NTP CONFIGURATION SCREEN

7. CONTROL & MONITOR FUNCTIONS

7.1 ON/OFF COMMAND

The On/Off command is a control function to switch a CELL (indoor unit) On and Off. The operation result of this command is the same as the On/Off from a remote controller of the indoor units. In case that a CELL consists of more than one indoor units, in other words, a remote controller group, all indoor units are switched On/Off simultaneously. In case that an indoor unit is defined as a CELL, the unit is able to be switched On/Off by this command.

If this Off command is sent to a CELL which is in the Failure status, that is the red LED on the remote controller is turned on, the Off command resets the Failure status, in other words, turns off the red LED regardless of the actual internal failure status of the unit. When the On command is sent to the CELL in this situation, the CELL would be switched on if the internal failure is removed, or the CELL would go Failure indication again with the red LED on, if the internal failure has not be removed.

7.2 MODE COMMAND

The Operation Mode command is a control function to set a CELL as AutoMode, Cooling Mode, DryMode, HeatingMode, or FanMode as same as setting from a remote controller. In case that a CELL consists of more than one indoor units, all indoor units are set to the same Operation Mode simultaneously.

7.3 SETPOINT COMMAND

The Setpoint command is a control function to set the setpoint temperature of a CELL as same as setting from a remote controller. The range of setpoint is from 18 to 30 degrees Celsius by 1 degree step.

7.4 FAN SPEED COMMAND

The Fan Speed command is a control function to set the indoor unit's fan speed selection of a CELL as same as setting from a remote controller. The range of fan speed selection is Lo, Me, Hi.

7.5 REMOCON LOCK/UNLOCK COMMAND

The Remocon Lock/Unlock command is a control function to set the remocon as reject mode or accept mode. Manipulation of all switches on the remote controller such as On/Off switch, Operation Mode switch, and so on are rejected or accepted according with this command's setting.

In the case of using a SUPERLINK optional controller such as the SLA-2A or the SLA-1 along with this Gateway, the optional controller should be set as the same remocon reject mode for the same CELL. Otherwise, the CELL which is set as different remocon reject mode will alternate its Lock/Unlock mode back and forth forever at the interval of several tens of seconds. This will cause a serious malfunction.

7.6 FILTER SIGN RESET COMMAND

The Filter Sign Reset command is a control function to reset the filter sign time-up indication on the remote controller of the CELL.

7.7 FAILURE STATUS

The Failure status indicates the status of the failure LED on the remote controller for the CELL. This status indicates if the red LED of the remote controller is on or off. This status does not necessarily means the actual internal failure mode of the air-conditioner. If the Reset command is sent to the CELL whose Failure status is on, that is the red LED is on, the LED will turn off and the Failure status goes off regardless the actual malfunction cause has been removed or not.

All the status functions such as this Failure status function are driven by the broadcast of the failure status from the indoor unit. In a rare case that this Gateway fails to receive this broadcast, the change of the status indication of this Gateway would delay for about 1 minute at the worst case. The Gateway inquires status change to every indoor unit at the 1 minute interval as a backup for the cases that the Gateway fails to receive the status change broadcast.

7.8 ON/OFF STATUS

The On/Off status function indicates the On/Off status of a CELL. In case that at least one indoor unit is running in the CELL, the On/Off status function indicates as "On" state. In case that none of indoors is running in the CELL, the On/Off status function indicates "Off" state. If one of the indoor units in the CELL is "Failure state" and the rest of indoor units are running normally, this function indicates "On" state and the Failure status function indicates "Failure state" for that CELL. This is as

same indication as that CELL's remote controller.

This On/Off status of a CELL indicates not only result of a control command from this Gateway but also result from other controllers. For example, the On/Off status reflects change of state of a CELL from the remote controller as well as from this Gateway.

As above-mentioned, in a rare case that this Gateway fails to receive the change of state broadcast from an indoor unit, the change of the On/Off status indication would delay for about 1 minute at the worst case.

7.9 OPERATION MODE STATUS

The Operation mode status indicates the status of operation mode, that is, AutoMode, Cooling Mode, DryMode, HeatingMode, or FanMode of a CELL. Each operation mode is same as that indicated on the remote controller of the CELL.

This operation mode status of a CELL indicates not only result of a control command from this Gateway but also result from other controllers. For example, the operation mode status reflects change of state of a CELL from the remote controller as well as from this Gateway.

As above-mentioned, in a rare case that this Gateway fails to receive the change of state broadcast from an indoor unit, the change of the operation mode indication would delay for about 1 minute at the worst case.

7.10 SETPOINT STATUS

The Setpoint status indicates the setting of the setpoint for the room temperature of a CELL. The setpoint is same value as that indicated on the remote controller of the CELL.

This Setpoint status of a CELL indicates not only result of a control command from this Gateway but also result from other controllers. For example, the setpoint status reflects change of state of a CELL from the remote controller as well as from this Gateway.

As above-mentioned, in a rare case that this Gateway fails to receive the change of state broadcast from an indoor unit, the change of the setpoint indication would delay for about 1 minute at the worst case.

7.11 FAN SPEED STATUS

The Fan Speed status indicates the setting of the indoor unit's fan speed of a CELL. The fan speed is same as that indicated on the remote controller of the CELL.

This fan speed status of a CELL indicates not only result of a control command from this Gateway but also result from other controllers. For example, the fan speed status reflects change of state of a CELL from the remote controller as well as from this Gateway.

As above-mentioned, in a rare case that this Gateway fails to receive the change of state broadcast from an indoor unit, the change of the fan speed indication would delay for about 1 minute at the worst case.

7.12 REMOCON LOCK/UNLOCK STATUS

The Remocon Lock/Unlock status indicates the setting of the remote controller as reject mode or accept mode. The remote controller lock/unlock status is same as that indicated on the remote controller of the CELL.

This remote controller lock/unlock status of a CELL indicates not only result of a control command from this Gateway but also result from other controllers.

As above-mentioned, in a rare case that this Gateway fails to receive the change of state broadcast from an indoor unit, the change of the remote controller lock/unlock status indication would delay for about 1 minute at the worst case.

7.13 FILTER SIGN STATUS

The Filter Sign status indicates whether the filter sign time-up indication on the remote controller on or off.

As above-mentioned, in a rare case that this Gateway fails to receive the change of state broadcast from an indoor unit, the change of the filter sign status indication would delay for about 1 minute at the worst case.

7.14 ROOM TEMPERATURE STATUS

The Room Temperature status indicates the sensor value of the inlet-air temperature of a CELL. In case that a CELL consists more than one indoor units, the sensor value of the indoor unit that has the

smallest SUPERLINK address among running indoor units of the CELL.

The range of the room temperature status value is from 0 degree to 35 degrees Celsius with 0.25 degree step. In the case of below 0 degree or above 35 degrees, the room temperature status indicates 0 or 35 degrees, respectively.

As above-mentioned, in a rare case that this Gateway fails to receive the change of state broadcast from an indoor unit, the change of the room temperature status indication would delay for about 1 minute at the worst case.

■ End of Document