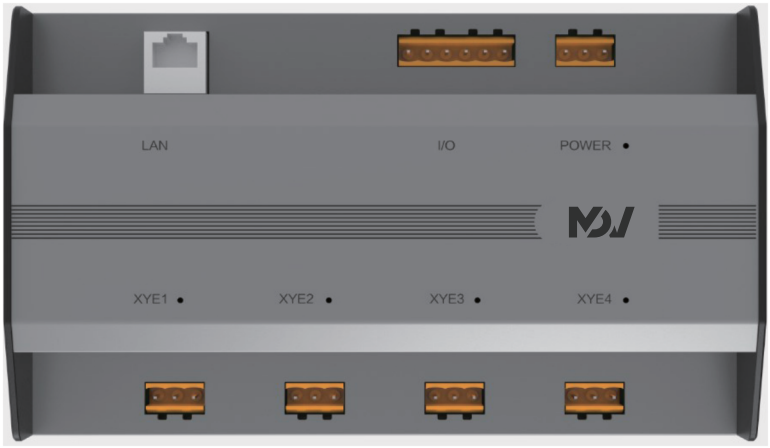
VRF

Commercial Air Conditioners

Service Manual

IMMP-BAC(A)



CONTENTS

Part1

Introduction

1 General

1.1 Safety Precautions

Please read these general safety precautions carefully before installing the IMMP-BAC(A).

After completing the installation, make sure the power supply and IMMP-BAC(A) operate properly during the startup operation.

General

	**NOTICE** Improper installation or attachment of equipment or accessories could result in electric shock, short-circuit, leaks, fire or other damage to the equipment. Only use accessories, optional equipment and spare parts made or approved by MDV.
	**WARNING** Make sure installation, testing and applied materials comply with the applicable legislation.
	**CAUTION** Wear adequate personal protective equipment (protective gloves, safety glasses,…) when installing, maintaining or servicing the system.
	**WARNING** Tear apart and throw away plastic packaging bags so that nobody, especially children, can play with them. Possible risk: suffocation.

Installation Site

Do not install the equipment in potentially explosive environment.

Electrical

	**DANGER: RISK OF ELECTROCUTION** ■ Turn OFF all power supply before connecting electrical wiring or touching electrical parts. ■ Disconnect the power supply for more than 1 minute, and measure the voltage at the terminals of main circuit capacitors or electrical components before servicing. The voltage must be less than 50 V DC before you can touch electrical components. For the location of the terminals, see the wiring diagram. ■ Do NOT touch electrical components with wet hands. ■ Do NOT leave the equipment unattended when the service cover is removed.
	**WARNING** A main switch or other means for disconnection, having a contact separation in all poles providing full disconnection under overvoltage category III condition, shall be installed in the fixed wiring.
	**WARNING** ■ Only use copper wires. ■ Make sure the field wiring complies with the applicable legislation. Do NOT touch electrical components with wet hands. ■ All field wiring must be performed in accordance with the wiring diagram supplied with the product. ■ Make sure to install earth wiring. Do NOT earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earth may cause electrical shock. ■ Make sure to use a dedicated power circuit. NEVER use a power supply shared by another appliance. ■ Make sure to install the required fuses or circuit breakers. ■ Make sure to install an earth leakage protector. Failure to do so may cause electric shock or fire.

*Note: Install the wires at least 1 meter away from televisions or radios to prevent interference. Depending on the radio waves, a distance of 1 meter may not be sufficient.

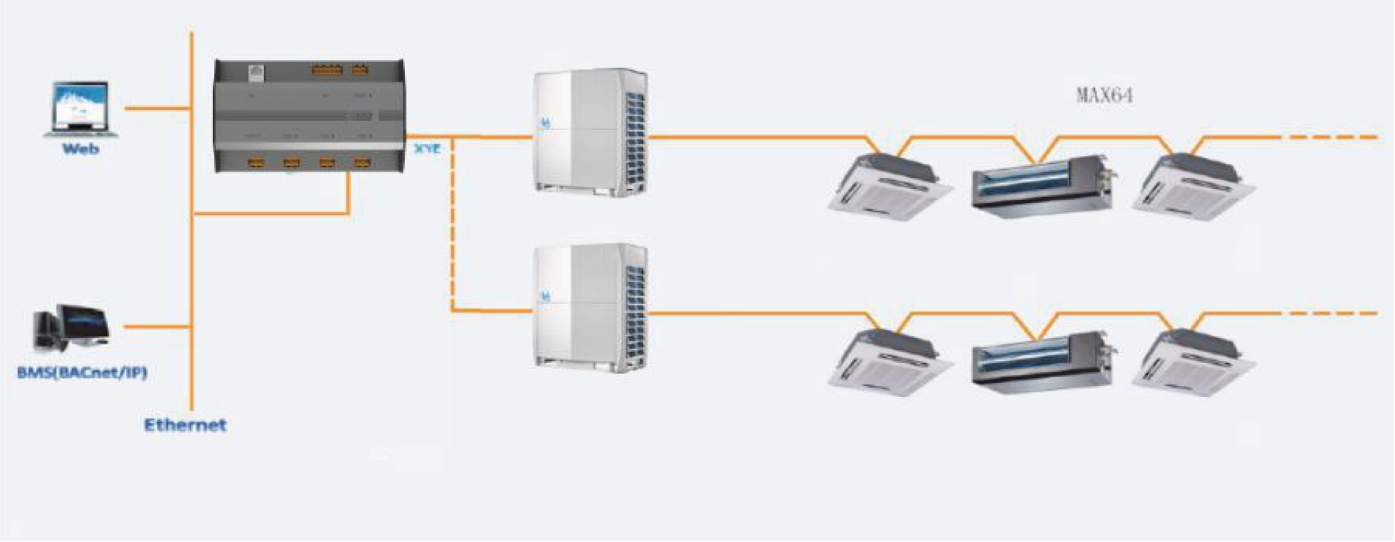
⚠	**WARNING** ■ After finishing the electrical work, confirm that each electrical component and terminal inside the electrical cabinet is securely connected. ■ Make sure all covers are closed before starting up the units.

Installation Safety

⚠	**WARNING** ■ Do not install the IMMP-BAC(A) near areas of electromagnetic interference or next to base station. ■ Locate the IMMP-BAC(A) away from sources of steams, possible flammable gas leaks, heat or sulfurous gases. ■ Reserve sufficient space for the installation, and leave adequate spacing between the device and surrounding community service network devices for heat dissipation. ■ Make sure that the installation site is indoors and the IMMP-BAC(A) is installed at a height that is 50 cm above the ground. ■ Make sure that the installation site is not exposed to sun and heating devices. ■ Make sure that the device is not installed in humid places or where it is easy for device to come in contact with water. ■ Make sure that the device is not installed in locations where it can be easily corroded or where there are flammable gases. ■ Please install the gateway device in strict accordance with the above instructions and do check the installation site carefully before installation.

2 IMMP-BAC(A) Overview

To solve the problem of not being able to connect IMMPRO and BMS software at the same time with one outdoor unit, MDV CAC comes up with the latest gateway, IMMP-BAC(A) which has the capacity to connect both the IMMPRO software and BACnet BMS software together. IMMP-BAC(A) is the network gateway for MDV V6/V6i/VX/VXi series of VRF central air conditioning units and is an important component of MDV CAC smart management system. The controller can connect to MDV VRF outdoor unit through the M-net XYE ports. It features a built-in BACnet function module and IMMPRO gateway function module. The gateway can be used with Intelligent Manager of MDV PRO (IMMPRO) to enable the billing function. At the same time the same computer can connect the gateway with the BMS software as well. In this way, both the websites of the IMMP-BAC(A) (IMMPRO website and BMS website) can function in parallel on the same computer. So, in case you have a BACnet BMS system running in a building, you can use this gateway to connect the MDV VRF units with the BMS gateway and at the same time to use the electricity charge distribution function of the IMMPRO, you can simply install the IMMPRO software also on the same computer and in this way both the BMS functions and billing of tenants for the amount of air conditioning used by them can be achieved together through the use of this new gateway. Each port of the IMMP-BAC(A) gateway can connect with a maximum of 64 indoor units and 32 outdoor units. The device has 4 XYE ports in total. At the maximum, they can connect with 384 indoor and outdoor units taken together.



IMMP-BAC(A) Connection Scenarios:

There are two ways in which we can use the IMMP-BAC(A) gateway device

1. Integrate with the building management system:

In this scenario, the IMMP-BAC(A) acts as the BMS gateway device and integrates with the BACnet Building Management System. The BACnet BMS system obtains the information about indoor and outdoor units by accessing a specific BACnet object. For details, refer to the corresponding “Object List” for details. As a result of this, when the IMMP-BAC(A) connects with the computer having the BACnet BMS software, the BMS software may be used directly. It is to be noted that both the BMS software and IMMPRO software can run parallel through this gateway on one computer.

2. Integrate with the IMMPRO software:

In this scenario, the controller is used as a gateway for the IMMPRO software. The functions while being used as the IMMPRO gateway are equivalent with the functions being provided by CCM-270B/WS(B) being used as IMMPRO gateway except the fact that IMMP-BAC(A) has 4 ports instead of 6 ports that are available for CCM-270B/WS(B). Using this way, we can use the IMMPRO software for billing the tenants according to their use of the VRF air conditioning system. It is to be noted that both the BMS software and IMMPRO software can run parallel through this gateway on one computer.

IMMP-BAC(A) Websites:

It is recommended to use a browser higher than Google Chrome 52.0 to access both the IMMP-BAC(A) websites. The gateway can connect to the local area network via switch. The computer or device must share the same network segment (192.168.1) as the IP address of the IMMP-BAC(A) gateway. (Refer to the Pre-Installation Settings in Installation & Commissioning part of this manual)

1. Using as a BACnet BMS gateway device:

The default BACnet website of the IMMP-BAC(A) gateway is https://192.168.1.8; which can be used to login to the BACnet website of the IMMP-BAC(A). It is to be noted that the functions available in the IMMP-BAC(A) BACnet website have been discussed in detail in the Functions part of this manual. These are just basic control functions for the units connected with IMMP-BAC(A). It is to be noted that, in case you want to change the IP of the IMMP-BAC(A) gateway, it can be done only through the IMMP-BAC(A) BACnet website only.

2. Using as the IMMPRO gateway device:

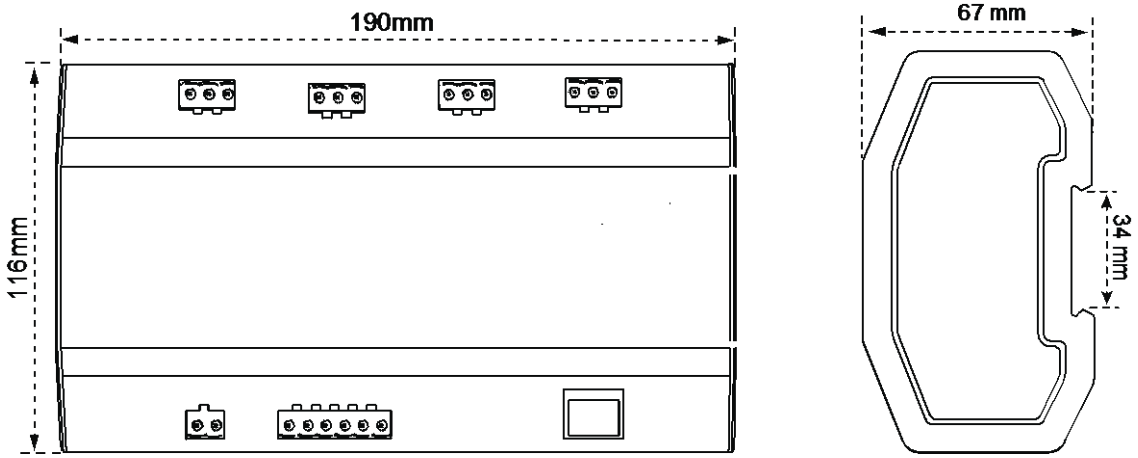
The default IMMPRO website for the IMMP-BAC(A) gateway is “IP: 8000/ui/login/login.html”. For example if the IP of the gateway device is 192.168.1.8, the IMMPRO web server address would be: http://192.168.1.8:8000/ui/login/login.html. The webpage functions in this website are the same as the other IMMPRO gateways being provided by MDV. The user needs to install the units in the IMMP-BAC(A) IMMPRO website first before using the IMMPRO software. (Refer to the Installation and Commissioning Part of this manual for more details.)

3 IMMP-BAC(A) Description

In this section, we will have a look at the various technical aspects of the IMMP-BAC(A) controller including the dimensions, specifications and details about the various ports of this controller.

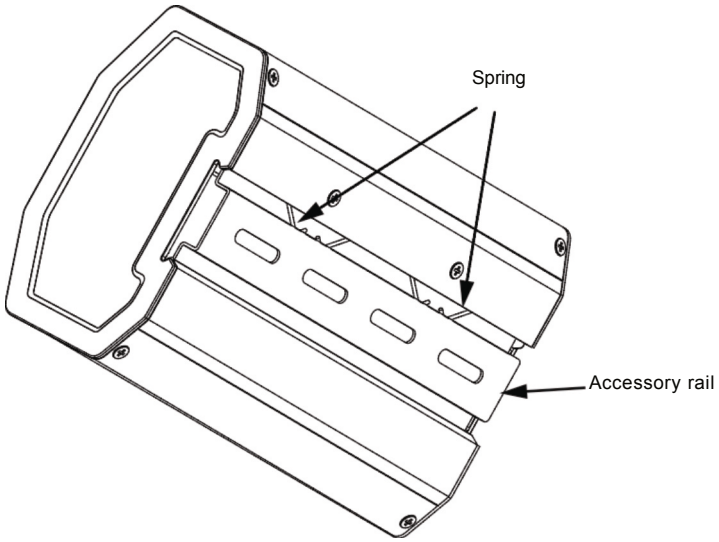
3.1 Dimensions

The following pictures show the dimensional aspects of the IMMP-BAC(A) controller:

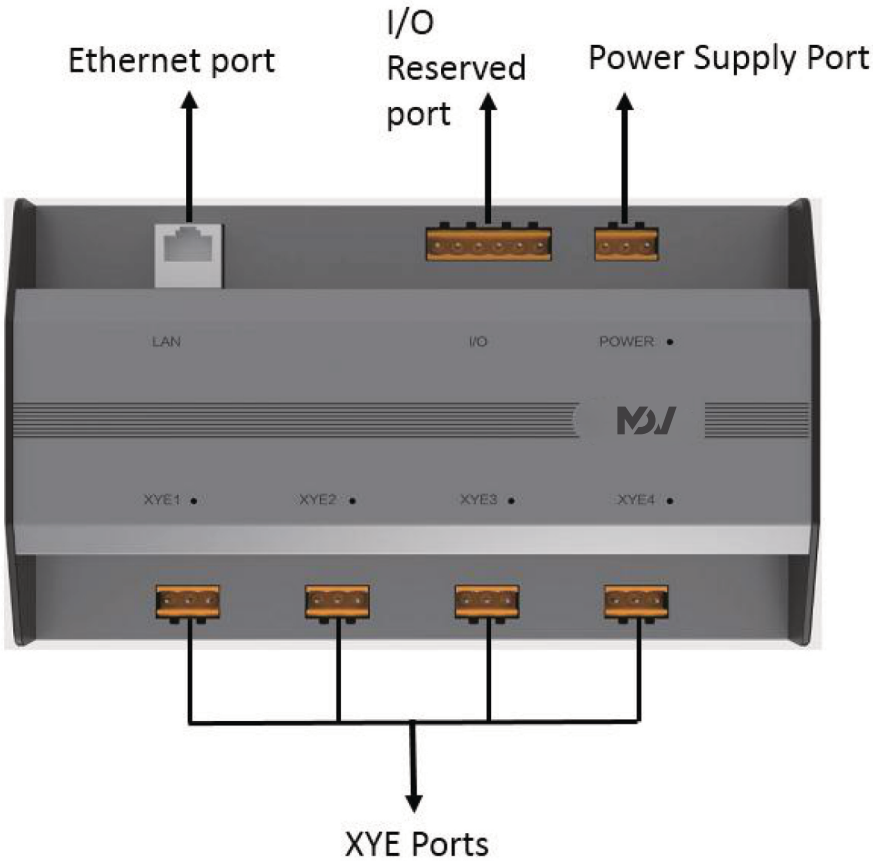


Installation Diagram

The product uses the rail type installation method: First secure the rail in the packing carton to the position where the product is to be installed and then fasten the spring of the gateway on the rail.



3.2 IMMP-BAC(A) Specifications



The IMMP-BAC(A) has four M-net ports (XYE), one Ethernet cable port, a power port and a power switch. It connects the MDV CAC Central Air Conditioning system with the M-Net ports and connects the local area network or Internet with Ethernet port. It uses a browser on computer or other similar devices to access the IMMP-BAC(A) websites to monitor the VRF units and do the required settings to connect the IMMP-BAC(A) with the IMMPRO or BACnet BMS software.

Important Points:

1. The IMMP-BAC(A) controller is installed at one end of M-Net communication bus. Do not install it in the middle of the communication bus.
2. You need a three-core shielded cable of AWG 20-22 for signaling wires.
3. The gateway must be on the same network segment as the upper computer of the building's control system or it will not be able to communicate with the upper computer.

Function	Description
Input Power	24 VAC 50/60 Hz*
CommunicationInterface	4X RS485 interface 1XRSJ45 Ethernet Port
Operation Environment	Temperature: 0~40 degree C
Dimensions	26cm*25cm*6cm
Weight	800g

IMMP-BAC(A) Numerical Analysis

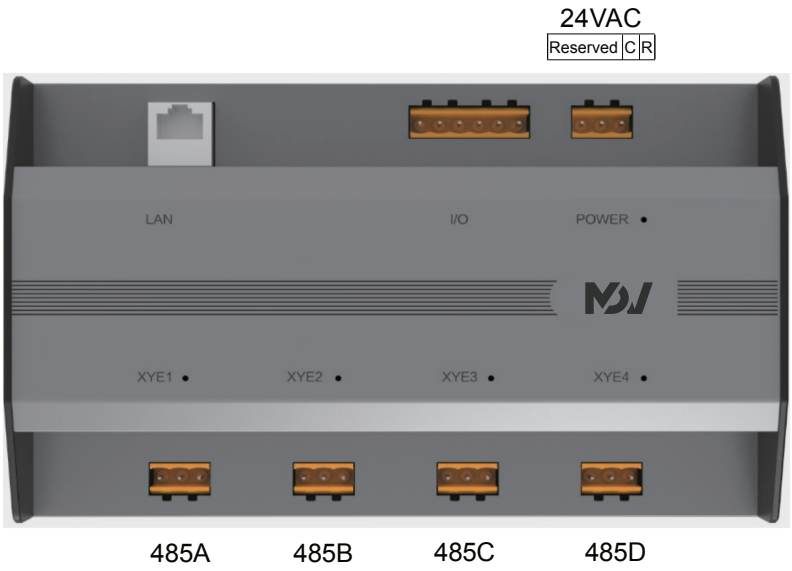
Here in this section, we have written the number of units that can be controlled by one IMMP-BAC(A) device. The numbers show up as follows:

Parameter	Number
Number of XYE Ports	4
Communication Wire Interface	XYE
Maximum number of IDUs in one port	64
Maximum number of ODUs in one port	32
Max No of IDUs+ODUs combined for IMMP-BAC(A)	384
Internet Access Mode	Ethernet
Power	24 VAC 50/60 Hz*

Note:* The charger for the gateway is not supplied inside the box and must be purchased from the outside market

3.3 Ports Description

The IMMP-BAC(A) gateway has the following ports as shown in the picture below. The functions of these ports have been described in the table below as well.



Port Name	Quantity	Description
M-Net XYE(485A~D)	4	To connect the refrigeration System
Ethernet Port(LAN)	1	To connect to network LAN cable
CR (Power Connection)	1	Power cable connections (24VAC)*
Input / Output (I/O)	1	Reserved

Note:* The charger for the gateway is not supplied inside the box and must be purchased from the outside market.

4 EnergyMeter Introduction

To use the Energy Statistics function of the IMMP-BAC(A) IMMPRO website (or with IMMPRO software), the energy meter should be connected to the outdoor units to monitor the energy consumed by the outdoor units which can be sent to the IMMP-BAC and hence it can be used by the software to calculate the energy consumed by various tenants.

Three Models of Energy Meter are available from MDV, which are listed as follows:

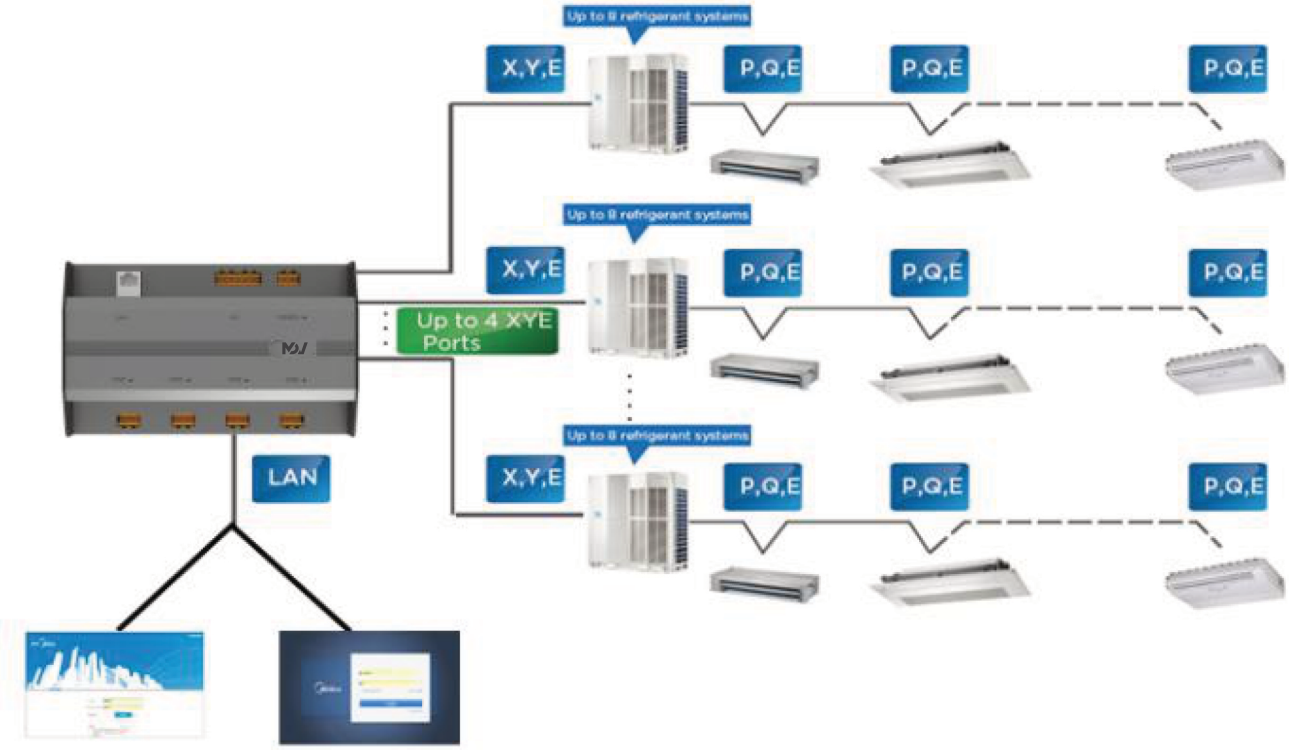
Model	Current	Comment
DTS 634/636	Up to 60 A	Phase out
DTS634-F	Up to 100 A	Phase out
DTS343-3	Up to 100 A	

DTS 634/636, DTS634-F

DTS343-3

5 IMMP-BAC(A) Network

The IMMP-BAC(A) gateway uses the M-net ports to connect to the MDV VRF units and the LAN port to connect to the local area network or internet. The network topology for IMMP-BAC(A) is shown in the picture below. The indoor units are connected together with the PQE signal cables whereas they also connect with the outdoor units with the PQE signal cables. The communication between outdoor units to outdoor unit is done with the help of H1H2E communication cables. The IMMP-BAC(A) gateway needs to be connected with the XYE terminal of the master outdoor unit. In case there is more than one system in one port of IMMP-BAC(A), there should be master to master looping of the XYE cables before finally connecting it with the IMMP-BAC(A) gateway port. It should be made sure that the IMMP-BAC(A) gateway is always connected at the end of such a loop only and not in between. The ENC4 settings should also be adjusted for the outdoor units from different systems. (The details about this are discussed in the Installation and Commissioning part of this manual.)



4 M-Net(485A~485D) ports are used to connect to the air conditioners. On each XYE port of the IMMP-BAC(A) the maximum number of indoor units that can be connected is 64 whereas the maximum number of outdoor units that can be connected is 32 outdoor units. Taking all of this in account, the maximum number of indoor and outdoor units that can be connected with 1 IMMP-BAC(A) can be up to 384.

6 Supported Models

1. Supports the V6/V6i/VX/VXi/VCi/VC Pro/Mini C series of outdoor units.
2. Communication Line to the M-Net(485A~485D) ports must be connected to the outdoor unit
3. The IMMP-BAC(A) is a gateway based on web technologies, and has nothing to do with the operating systems of computer or other similar devices. Once you are connected to the network, you can use the browser on the system to view the web page anytime, anywhere. Chrome browser (version 52.0 or above) is recommended.

7 Languages Supported

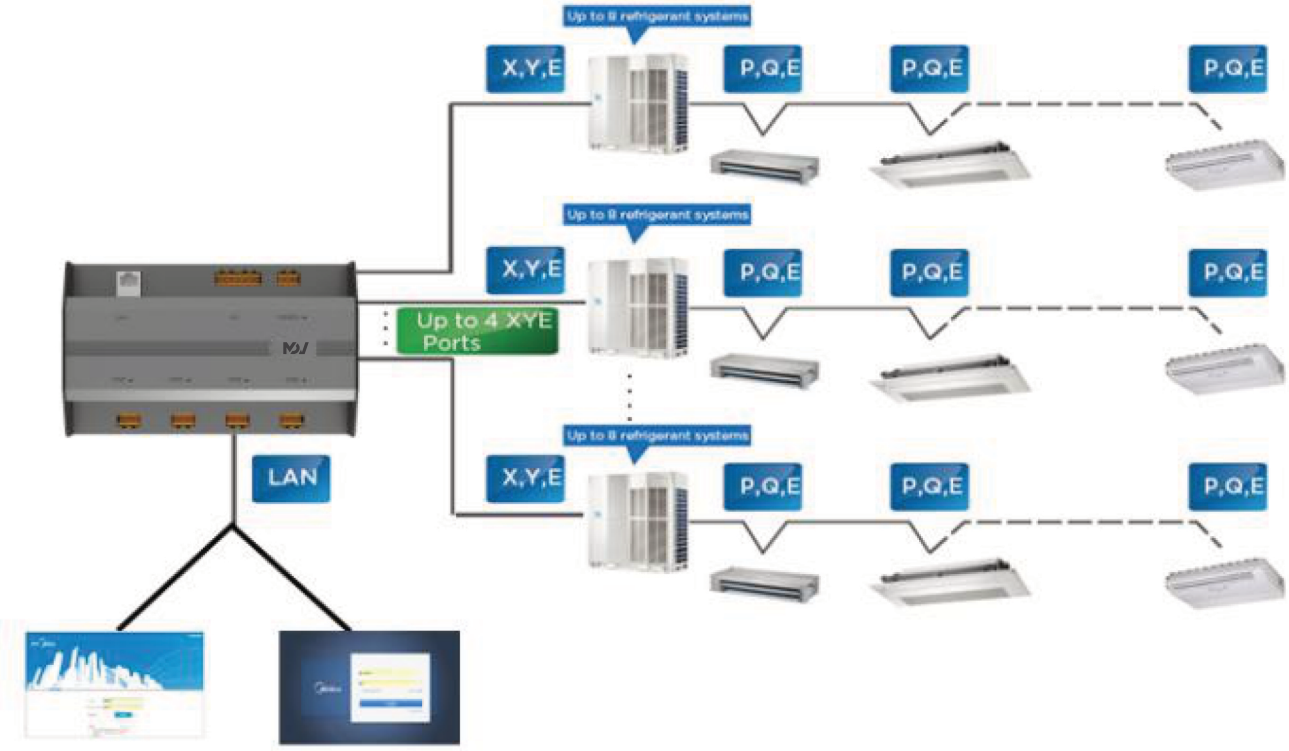
For the current version, the IMMP-BAC(A) can support 12 languages. These 12 languages are as follows: **English, Chinese, French, Spanish, Portuguese, Italian, German, Polish, Turkish, Russian** and **Korean.**

Part 2 Installation & Commissioning

Installation and Commissioning

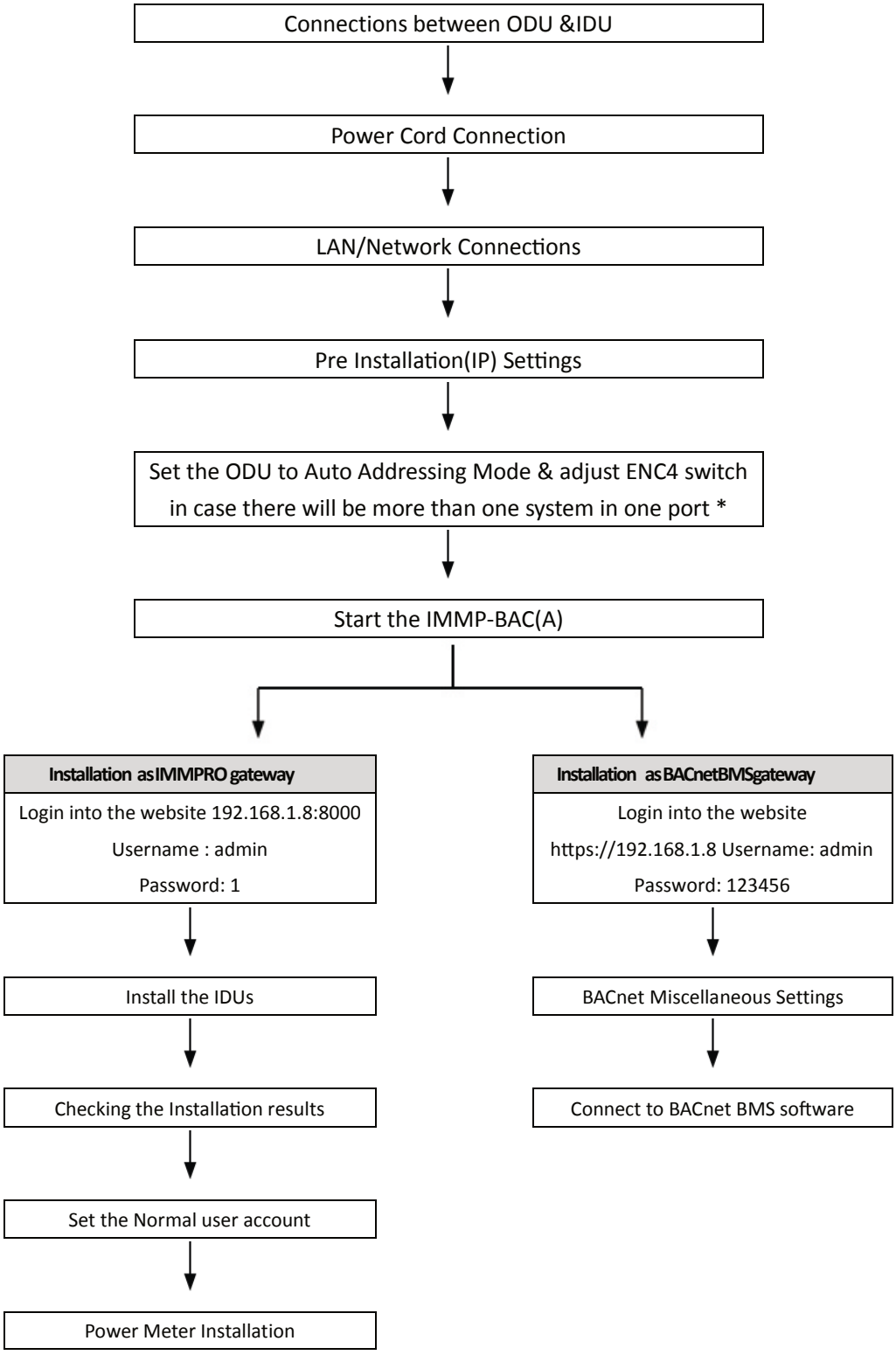
In this section, we will take a look at the various connections and configurations that need to be done between the IMMP-BAC(A) & computer to make the IMMP-BAC(A) and higher devices (IMMPRO or BACnet BMS software) run successfully. As we know, there are two ways in which we can install the units in the IMMP-BAC(A) (IMMPRO) website i.e. the Auto Topology and Manual topology. Here, we will have a look at both these also in topology modes section. For the BACnet section, we can use this gateway to connect with the BACnet BMS software. Both the IMMPRO and the BMS software can run parallel without interruption with the use of the IMMP-BAC(A) gateway

In this manual, we have divided the installation and commissioning of the controller according to its use as the IMMPRO gateway or the BACnet BMS gateway. The installation and precautions required for both the cases have been discussed in deep detail in this part of the manual.



1 Flow Chart

Before we discuss in detail about the various steps that need to be followed for successful installation and commissioning of IMMP-BAC(A) device, below is listed a flow chart of all the events that need to be followed. In this flow chart is given a sequence of actions that need to be followed to successfully finish the installation and commissioning of the IMMP-BAC(A) device.



*The ENC4 setting is not required in case there is only one system in one port of IMMP-BAC(A) device.

2 Connectionsbetween ODU and IDU

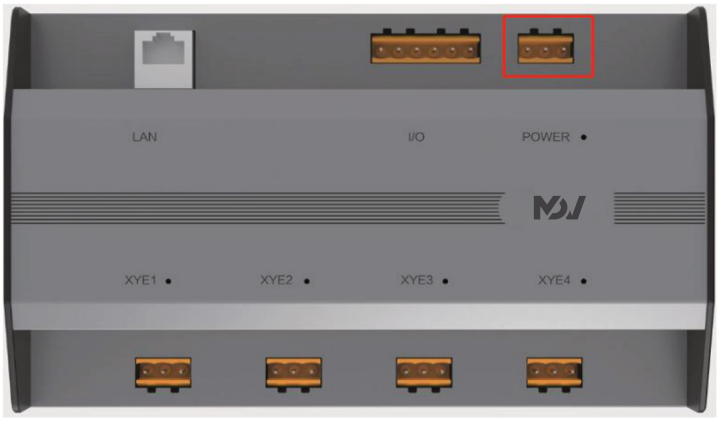
Connect the IDU and ODU following the respective installation manuals. Connect XYE from the master ODU to the XYE port of IMMP-BAC(A).

Important Points:

1. In case, where one port is connected to multiple systems, make sure that the system address, IDU address and ODU network address on the same port do not overlap.
2. The Linear order of the ports is XYE from left to right. Each port supports 64 IDUs, 32 ODUs and 8 refrigerant systems in one port. The total number of devices that can be supported by 1 IMMP-BAC(A) is 384 devices at most.

3 Power Cable Connections

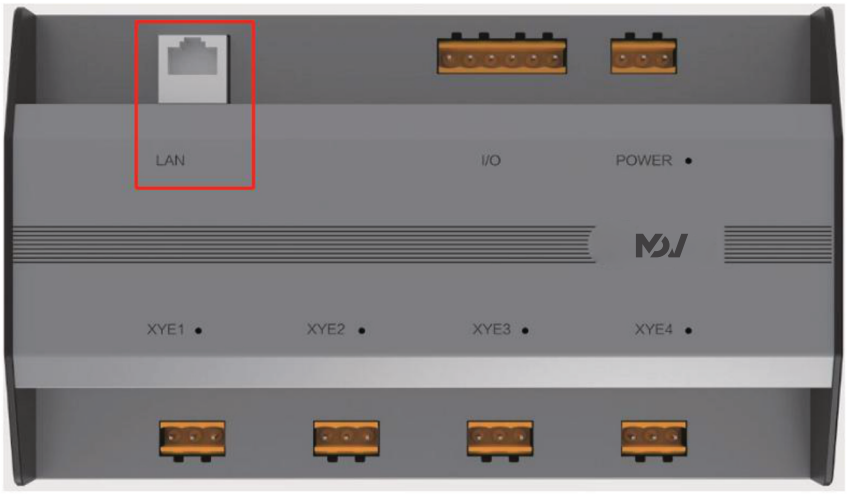
We need to make sure that the power supply has been provided to the IMMP-BAC(A). If the power supply is not there, we cannot perform the further operations such as searching the units. The power cord of 24V AC is not supplied inside the box of IMMP-BAC(A) and must be purchased from the outside market



(Highlighted is the power cable port of IMMP-BAC(A),24V ACpower supply must beconnectedto this port)

4 Network Connections

Insert the network cable to the Ethernet port. There can be different ways of connecting with the network that is by a LAN cable or by router (in case more than one IMMP-BAC(A) is being used). The details about this part have been discussed in the pre installation settings in detail.



(Highlighted is the Ethernet port of IMMP-BAC(A))

Important Points:

1. The default Ethernet IP of the IMMP-BAC(A) is 192.168.1.8 (However the website for the IMMPRO gateway is 192.168.1.8:8000 whereas for BMS gateway the website is https://192.168.1.8)
2. The IMMP-BAC(A) controller obtains the static IP.

5 Pre-Installation Settings

(IP Settings): The IP settings are required to be done in order that the computer or other similar device that is being used to access the website of IMMP-BAC(A) (BMS or IMMPRO both) is able to find the IMMP-BAC(A) gateway. To make this happen, we are required to make sure that the computer or other similar device has the IP configured. In this section, we have discussed about this setting.

Local Network Connections

The IMMP-BAC(A) gateway uses a switch to connect to the local area network. The IP addresses of the computer or other similar equipment and that of IMMP-BAC(A) must be located in the same subnet segment (192.168.1.xxxx). The IP of the computer needs to be changed into one that is in the same subnet as that of the IMMP-BAC(A) gateway. For doing the concerned settings, the procedure is given as below.

IP Settings

The default IP of the IMMP-BAC(A) is 192.168.1.8(The website for IMMPRO section is 192.168.1.8:8000 where as for BMS section, the website is https://192.168.1.8) with subnet mask of 255.255.255.0. For the IP of a computer or other similar equipment, we need to manually configure the static IP that must be within 192.168.1 segment with 255.255.255.0 as the subnet mask. The following figure shows the implementation method (Windows 7 system as an example).

1. Configure Single IP Address(Most Preferred Method):

For the IMMP-BAC(A) gateway, to connect with the computer it needs to be verified that it is in the same IP segment as the computer. To make this happen, we need to make sure that proper IP Configuration settings have been done. Following are the steps that need to be followed to complete the IP settings:

Default IP of IMMP-BAC(A) is 192.168.1.8; subnet mask is 255.255.255.0. The gateway's IP address and IMMP-BAC(A) server must be in the same subnet area. If you want to modify the gateway's IP address through the WEB page, you need to manually configure static IP address of the PC or other similar devices (IPad, Laptop etc.), and static IP must meet the following requirements: within 192.168.1 segment, subnet mask is 255.255.255.0. The single IP is the general configuration, if the PC IP address is not easy to modify, we can use to configure multiple IP ways. Let's take Windows 7 for an example.

Dialogbox1: Open the Network and Sharing Center of the computer for which the IP configuration are required to be done.

DialogBox2: Select the LAN cable network through which the IMMP-BAC(A) is connected to the computer

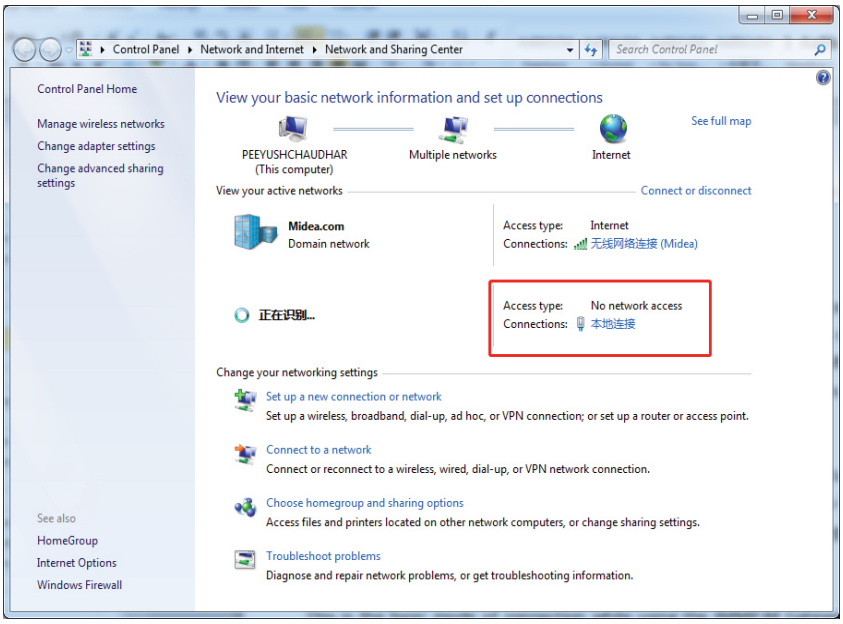
*Make sure not to connect the computer with any other wireless network while using IMMP-BAC(A).

DialogBox3: Openthe Properties Dialog Box from the Network and Sharing Center Tab.

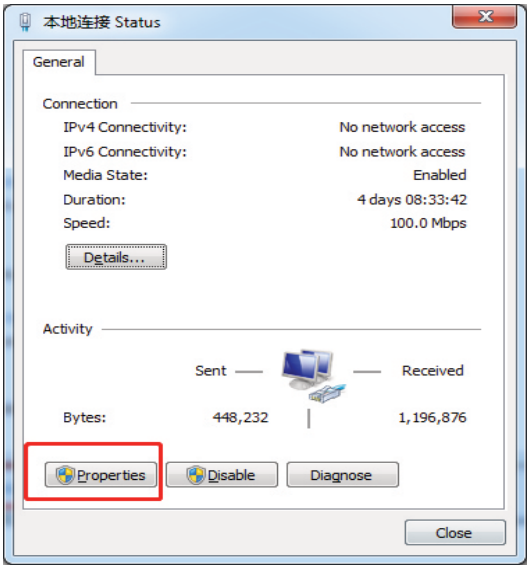
DialogBox4: Select the IPV4 settings.

DialogBox5:Makesure that the configured IP of the computer is in the subnet 192.168.1. xxx (where xxx can be between 00 to 255 except for the value of the IP of the IMMP-BAC(A).

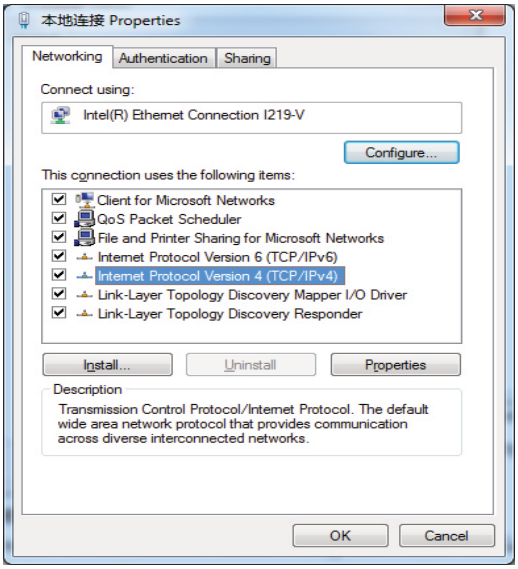
(Dialog box 1)



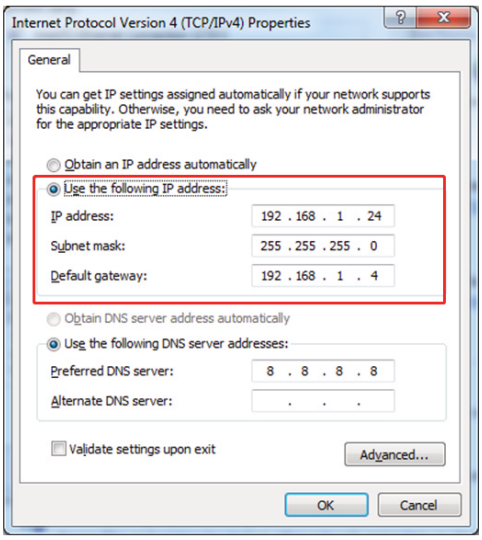
(Dialog box 2)

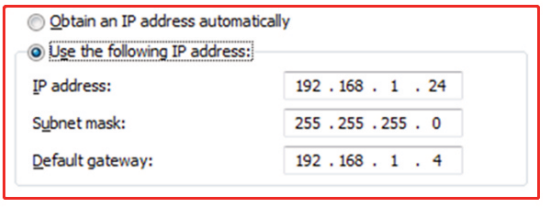


(Dialog box 3)



(Dialog box 4)





(Dialog box 5)

After you finish this IP configuration, try to visit the website of the IMMP-BAC(A) by typing the IP address (192.168.1.8:8000 for IMMPRO gateway website or https://192.168.1.8 for BACnet gateway website) in any of the web browser (preferably Google Chrome 52.0 or above) if the website of IMMP-BAC(A) is getting opened, it means that the IP configuration setting is successful.

2. Add Multiple IP Address:

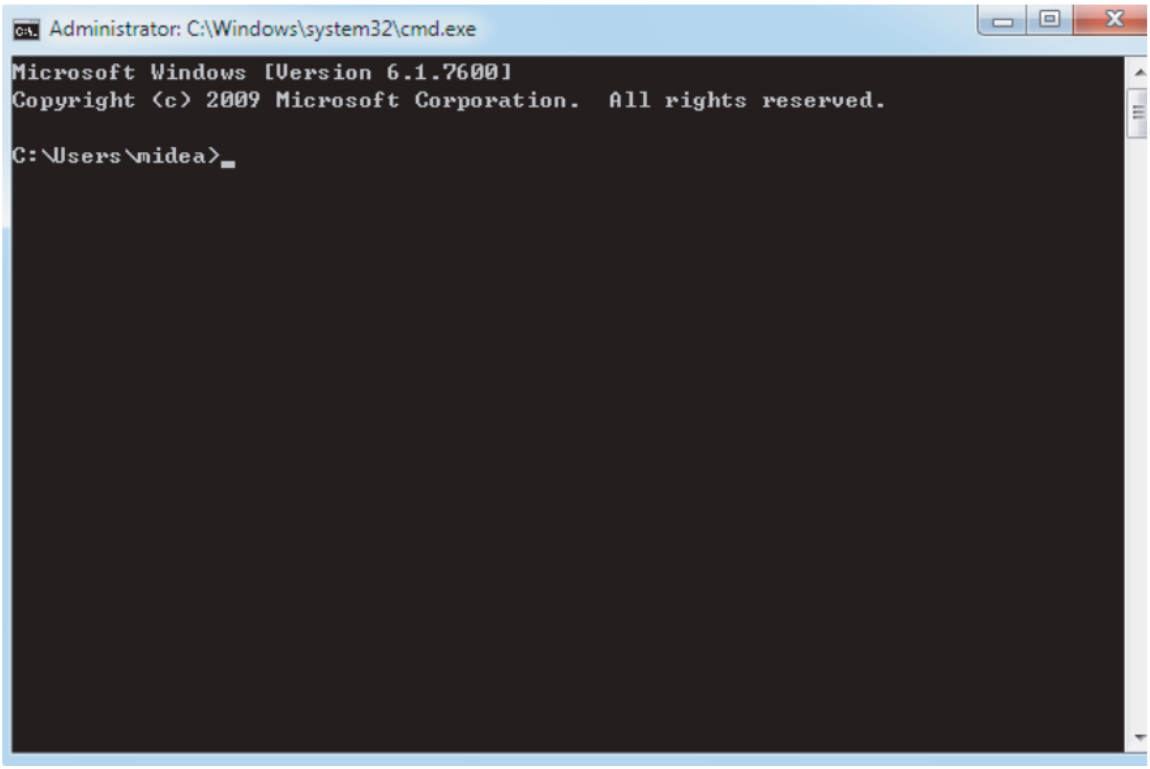
You need to first configure a static IP address before you can add multiple IPs. The steps to configure the static IP are as follows:

1) Check local IP address

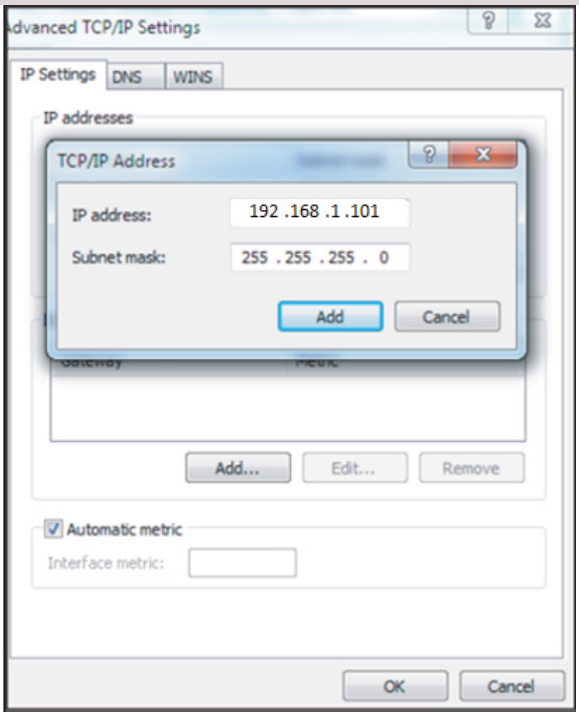
Open TCP/IP properties as shown in Figure above. If the option "Use the following IP address:" is selected and there is an IP address listed here which means that the local IP is a static IP address otherwise, it is a dynamic IP address, and you need to configure a static IP address.

2) Configure static IP address

Open the Run Command box from the Start Menu, as shown in the following figure:



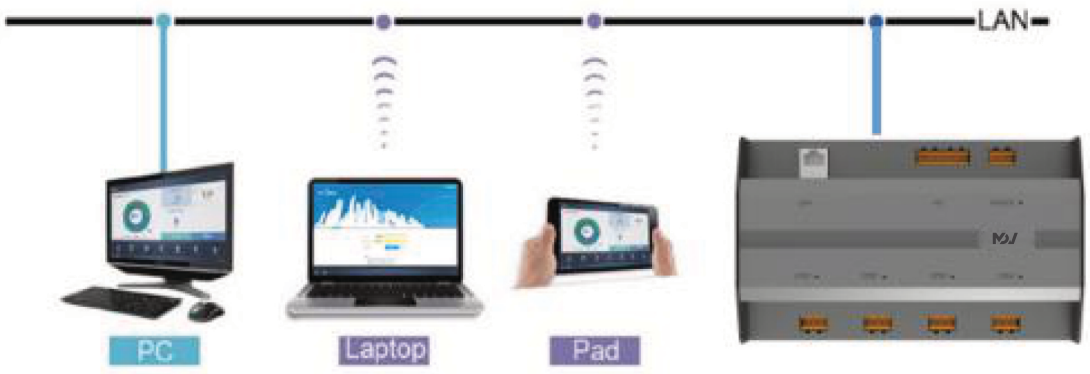
Enter "ipconfig" in the above to display the local dynamic IP address. Use this address as the IP address in TCP/IP properties to complete the static IP address configuration. Consult the local network administrator for details. Once the static IP address has been configured, open the Internet Protocol TCP/IP Properties page again. Select "Advanced..." to go to the TCP/IP Address page, as shown in the following figure.



Click "Add" under the IP addresses bar to add an IP address in the same segment as "192.168.1.8". For example, IP address is 192.168.1.101 with 255.255.255.0 as the subnet mask. Then, click "OK".

3. Local LAN Access:

As long as the computer or other similar equipment in the LAN is in the same segment as the IMMP-BAC(A), you can use the address bar in the browser on its operating system to enter the address to link to the Web page of the IMMP-BAC(A) (The website for IMMPRO section is 192.168.1.8:8000 whereas for BMS section, the website is https://192.168.1.8). The topology of local access is as shown below:



6 Auto AddressingMode

While using the IMMP-BAC(A), one should always check that the S6 switch has been set to the auto addressing mode. The following settings need to be checked for this.

Switch	Setting	Switch positions[1]	Description
S6-3 	Addressing mode		Auto addressing (default)
			Manual addressing

The S6-3 switch is available on the outdoor unit main PCB and this setting needs to be done on the master ODU. Irrespective of the fact that you are using the gateway for BMS or IMMPRO, the Master ODU should always be set to Auto Addressing while using IMMP-BAC(A) gateway device

7 ENC4Switch Settings

The ENC4 switch is used to set the network address for the unit. This network address is basically done so that the higher devices like IMMPRO or BACnet BMS Software are able to distinguish the various outdoor units. Let's discuss the settings for this switch.

ENC4 	Network address		Only 0, 1, 2, 3, 4, 5, 6, 7 should be selected (default is 0)

In case there is only one system in each port of IMMP-BAC(A), so there is no need to set the ENC4 switch for this situation. We can keep the network address of the outdoor unit as 0 will be okay as the outdoor units would be distinguished from each other on the basis of settings of ENC1 switch irrespective of the fact that we use the IMMP-BAC(A) BACnet website or IMMPRO website

In case there is more than one system in each port of IMMP-BAC(A), we need to distinguish each of the outdoor unit from the other. So for making this happen, we need to see that the network address for each of the outdoor unit is distinguished and combined with the ENC1 setting for the outdoor unit, each outdoor unit gets differentiated from the other outdoor unit available in the same port.

We need to change the ENC4 setting for each system outdoor unit. For Eg. If there are 8 systems connected in one port of the IMMP-BAC(A), then for the outdoor unit of each system the ENC4 value should be same. For Eg. Let us consider that we give the address 0 to the outdoor units of the first system, as we know that the outdoor unit address for each ODU is set through the ENC1 switch. Now after combining the settings of ENC1 and ENC4 each outdoor unit will have a certain unique address in each port and hence is the purpose of this setting achieved. In the same fashion, we can give the ENC4 values of 1, 2, 3 and so on for other systems in the same port.

8 Start the IMMP-BAC(A)

Connect the 24 V AC charging cable to the IMMP-BAC(A) power supply port and turn on the power supply, the IMMP-BAC(A) will start.

9 Installation as IMMPRO gateway

The above 8 steps discussed up till now are same for both the cases while the controller being used as an IMMPRO gateway or a BACnet BMS gateway. However, in this section, we will focus on the settings which are required for the installation as an IMMPRO gateway. These are basically the settings which need to be done in the IMMPRO website of the IMMP-BAC(A) hardware. The default IMMPRO website for the IMMP-BAC(A) gateway is 192.168.1.8:8000.

9.1 Topology Modes

Before we go to the further sections and discuss in details about the installation, it's important for us to understand the concept of topology and what differences the two kinds of topology can have on the working of our IMMP-BAC(A) gateway device. In this part we have explained the two topology methods in detail.

9.1.1 Auto Topology Mode

This is the basic mode of connection while using the IMMP-BAC(A) gateway. This type of topology does not require the user to upload any topology file into the website. The user simply needs to connect the units with the gateway and on searching the information about the air conditioning units through the "Install" tab, would be available to the website. But this kind of topology can only be used when we use the latest 2nd Generation DC IDUs with the V6/V6i/VX/VXi ODUs only. For any other combination, it is not recommended to use this topology.

Function	Number
Number of XYE Ports	4
Maximum IDUs for 1 XYE Port	64
Maximum ODUs for 1 XYE Port	32
Max Number of Systems for 1 XYE Port	8
Maximum Number of Indoor Units + Outdoor Units	384
Maximum Number of Refrigerant Systems	4*8=32

IMMP-BAC(A)

9.1.2 Manual Topology Mode

This topology mode is used when we try to do misconnections (connect 1st Generation DC/AC IDUs with V6/V6i/VX/VXi ODUs or connect 2nd Generation DC/AC IDUs with Non-V6/V6i/VX/VXi/VC Pro/ Mini C or VC-i ODUs). In this case, it needs to be communicated to the IMMP-BAC(A) what are the actual connections between ODU and IDU, hence this type of topology file needs to be uploaded in the website. The details about the Manual topology document have been discussed in the lower part of this section in detail. In case the IDUs are not the 2nd Generation DC or AC platform, the user needs to use the manual topology mode.

*Note- The gateway will not work if we connect it with the following combinations:

Non-V6/V6i/VX/VXi/VCi/MiniC/VCpro ODU & 1st Generation DC/AC IDUs

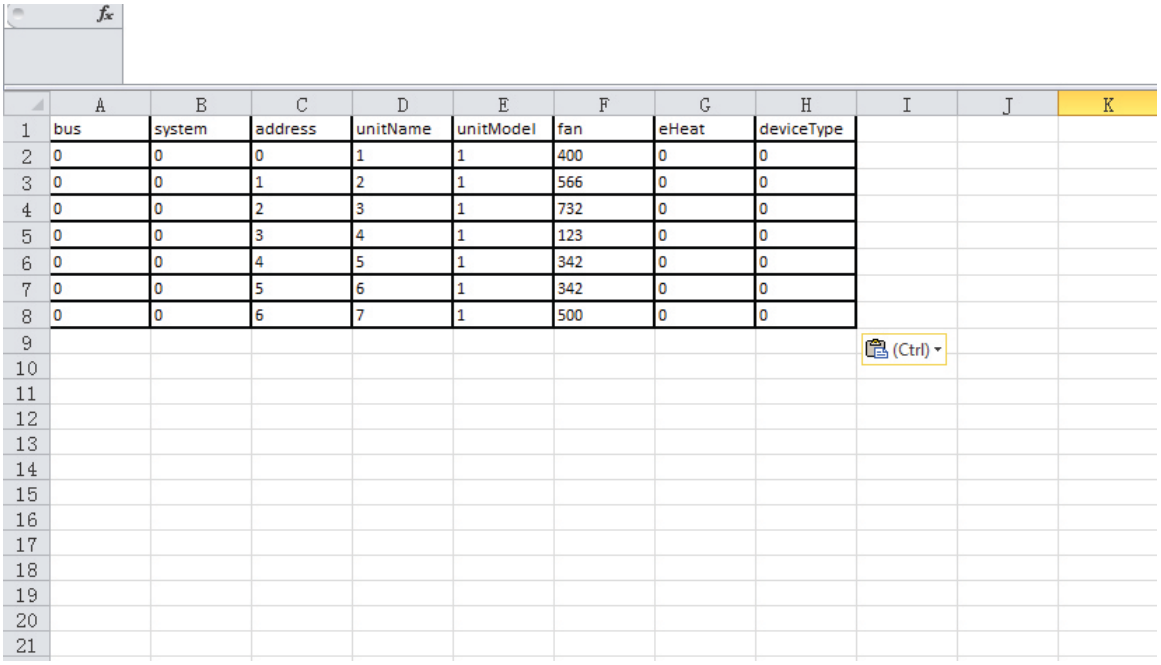
Function	Number
Number of XYE Ports	4
Maximum IDUs for 1 XYE Port	64
Maximum ODUs for 1 XYE Port	32
Max Number of Systems for 1 XYE Port	8
Maximum Number of Indoor Units + Outdoor Units	384
Maximum Number of Refrigerant Systems	4*8=32

Manual Topologydocument

In case of using the manual topology mode, we need to supply the complete information about the connections between the ODU and IDU to the IMMP-BAC(A) in the form of a topology document.

The topology file can be made in Microsoft Excel and it needs to be saved with the extension ".csv" from where it can be used as a manual topology file for IMMP-BAC(A) IMMPRO website (192.168.1.8:8000). The various columns that need to be filled in this document are explained as under:

The document would be made in excel as follows:



	A	B	C	D	E	F	G	H	I	J	K
1	bus	system	address	unitName	unitModel	fan	eHeat	deviceType			
2	0	0	0	1	1	400	0	0			
3	0	0	1	2	1	566	0	0			
4	0	0	2	3	1	732	0	0			
5	0	0	3	4	1	123	0	0			
6	0	0	4	5	1	342	0	0			
7	0	0	5	6	1	342	0	0			
8	0	0	6	7	1	500	0	0			
9									(Ctrl)		
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											

Exampleof manual topology file

The following columns in this file are explained as under:

Column	Description
bus	0-5 depending up on the port in which the units are connected. He left most port is 0 and so on
system	Refrigerant system address (0-7). This is the address set on the Network address switch **ENC4**on the main board of the ODU for each system. If there are more than one system connected in one port of CCM-270B/WS(A), the network address for each system must be different.
address	Equipment address (ODU 0-30), IDU (0-63). This is the address of the indoor unit or outdoor unit. For calculating the ODU address, use the formula: **ODUAddress=ENC4*4+ENC1**
unitName	Name of the equipment (equipment names cannot overlap, the maximum name length is 12 charters only)
unitModel	Model (IDU 0-12, ODU 0-2); For details, refer to the next page
fan	Fan power is 0 by default (This is the power consumed by the indoor unit fan motor. You can use the value mentioned in MDV indoor unit manuals)
eHeat	Electric auxiliary heating power is 0 by default (For relations between electric auxiliary heating power and the corresponding models, refer to the IDU manual)
deviceType	Equipment type (IDU 0; ODU 1)

After finishing this document, the user needs to save this document with the extension of .csv and can thereafter be used as a manual topology file.

There may be some prompt error message which may pop up while trying to upload these files; these prompt messages have been explained as under:

Prompt Message	Description
Failed to import files.	If the columns, such as bus, system, address, unit Model, fan, eHeat and device Type, do not exist, the system will report errors for non-digital input
Failed to import files.	Negative numbers exist in topology files
The imported system bus exceeds limit. Please confirm it before search.	IMMP-BAC(A) port is not within 0-3
The imported refrigerant system exceeds limit. Please confirm it before search.	Refrigerant system address is not within 0-7
An invalid device type is imported. Please confirm it before search.	The imported equipment type is not within IDU 0 and ODU 1.
The imported IDU address exceeds limit. Please confirm it before search.	IDU address is not within 0-63
The imported ODU address exceeds limit. Please confirm it before search.	ODU address is not within 0-31
The imported equipment type exceeds limit. Please confirm it before search.	IDU address is not within 0-12 and ODU address not within 0, 1, 2, 31, 32
The imported data contains duplicated data. Please confirm it before search.	More than two pieces of equipment overlap in the imported data. Standard for data overlap is (the same bus, the same address and the same equipment type)
The imported data contains duplicated data. Please confirm it before search.	The imported equipment names overlap
No files meet format requirements	Only parse CSV files. If no such files, the system will report errors
Failed to import files	If files are damaged, an error will be reported when reading file streams
If column names unable to parse exist in the imported columns, please correct the names before import.	If other files are changed to CSV format, errors occur when parsing
The length of imported equipment name exceeds limit.	Equipment name cannot exceed 12 characters
The length of imported fan power exceeds limit.	Fan power cannot exceed 65535
The length of imported auxiliary heating power exceeds limit.	Motor power cannot exceed 65535
Contents of imported files are empty.	Errors occur when contents of imported files are empty
If column names unable to parse exist in the imported columns, please correct the names before import.	Unable to parse if importing column names beyond the Notes on Topology Files. Errors will be reported in this case.

Unit Model

This value needs to be put in the "unitModel" column of the above discussed manual topology document. As per the value in this column, the icon for IDU or ODU will be displayed in the CCM-270B/WS(A). Currently, the following models are available for showing in the indoor units or outdoor units.

For IDU Models:

UnitModel (Put this value in the unitModel column)	IDU Type	Icon Shown
0	Old IDU	
1	4-Way Cassette (4-WAY)	
2	Wall-mounted	
3	Medium Static Pressure Duct (M-Duct)	
4	Low Static Pressure Duct(L-Duct)	
5	Air Handling Unit (AHU)	
6	High Static Pressure Duct (H-Duct)	
7	Compact 4-Way Cassette (COMPACT)	
8	Ceiling & Floor	
9	Vertical Type Concealed	
11	Fresh Air Processing Unit	
12	Inverter Split AC	
13	HRV	
14	1-Way Cassette	
15	2-Way Cassette	
16	Console	
17	HTHM	
21	AHUKIT (return air control)	
22	Floor standing unit	
24	AHUKIT (discharge air control)	
/	IDUs in Wired Controller	

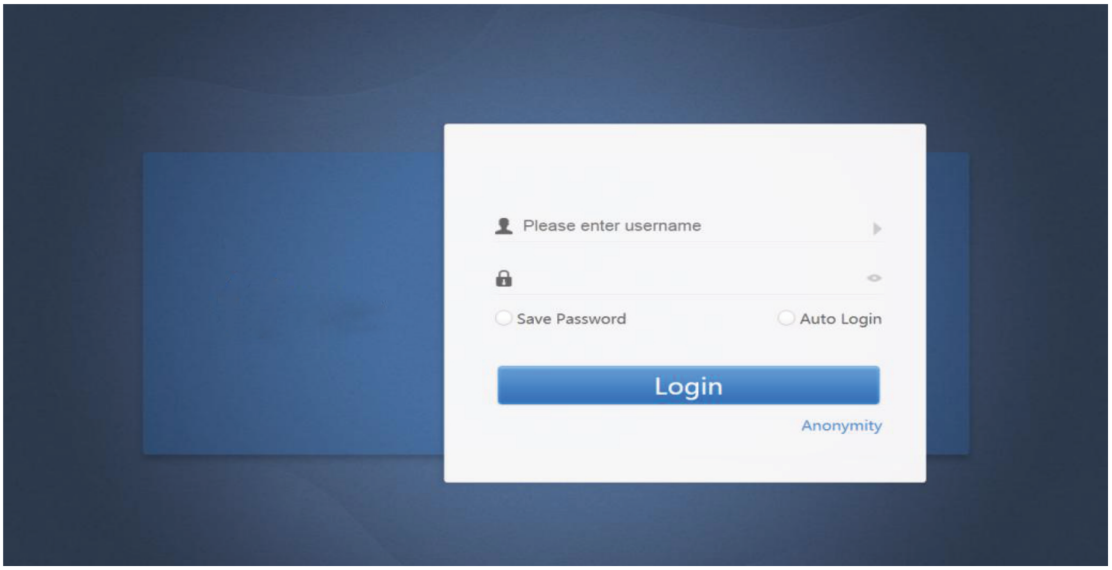
For ODU Models:

In case of outdoor units, the classification is much simpler. The code 0 : Stands for Mini VRF icon whereas code 1 stands for other standard VRF icons.

Yes, the manual topology document can also be used in case of auto topology that is when we connect the 2nd Generation DC/AC indoor units with V6/V6i/VX/VXi/VCPro/Mini C/VCi outdoor units. Of course, we can simply use the auto topology mode for this combination and we don't need to use the manual topology here and the controller can automatically detect the indoor units by itself. But, there are a few advantages in case we use the manual topology document here.
We can write the the name for the devices in the topology file according to our convenience as it is slightly easier to write the names in the Excel file rather than the software. But in case, you want to use this option, you should make sure that along with the name, all the other columns in the manual topology document are also filled properly.

9.2 Login

Use Chrome 52.0 or latest versions only to access the IMMP-BAC(A) websites. Type 192.168.1.8:8000 in the address bar to enter the login page. Enter the username and password and click Login.

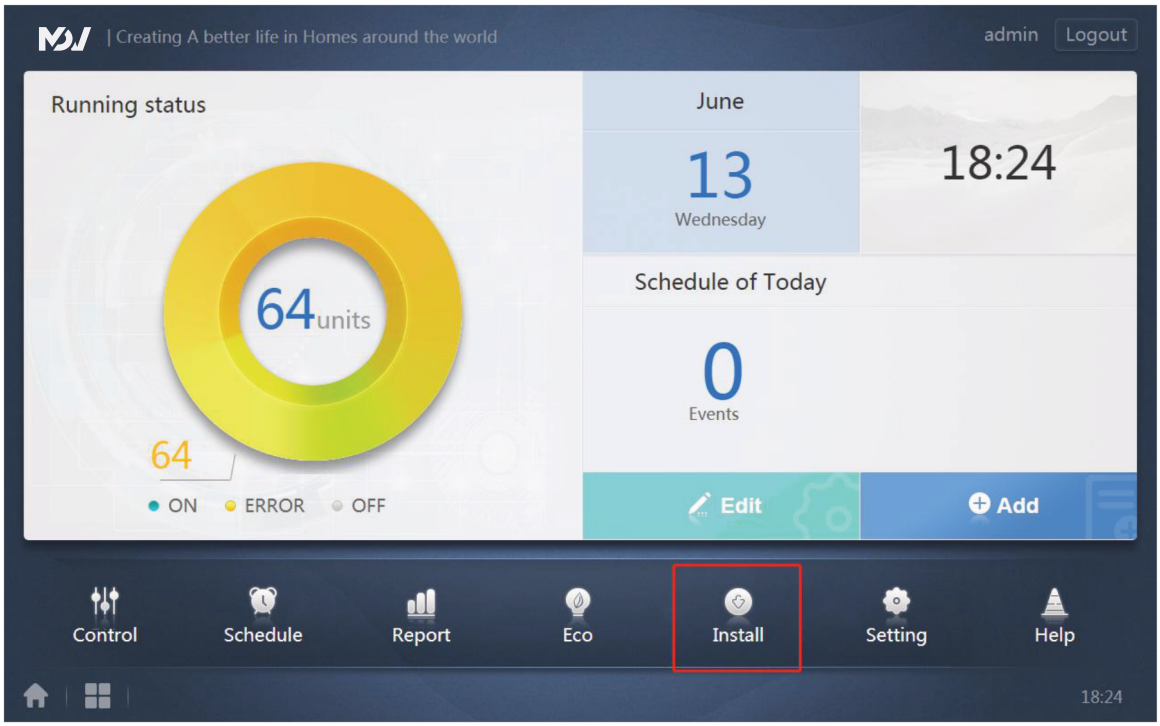


*Notes: 1. For Administrator account, Username: admin; password: 1

2. An administrator account has authority to install an air conditioner, modify the equipment information and create or modify a general account for the users. Keep the username and password safe

9.3 Install the IDUs

After successful login, we need to install the IDUs from the IMMPRO website (192.168.1.8:8000) of IMMP-BAC(A). We will reach the homepage of the IMMP-BAC(A) IMMPRO website. Click on the Install tab to enter the Installation page



On the Installation Page, select the required installation Mode that is Auto Topology or Manual Topology respectively.

AutoTopology: WhenIDUs are new and using V6/V6i/VX/VXi platform having one system in each port, we can use the auto topology.

ManualTopology: WhenIDUs are of old platform or more than one system in each port for new IDUs.

How to use Auto Topology:

1. Click Auto Topo
2. Wait for 7 minutes and then check the Topo results.

Important Points:

1. Ensure that ODU has started and completed auto addressing before using this Topo setting.
2. Do not operate the gateway during this time to prevent topo failure
3. It takes about 7 minutes to complete the Install IDUs process. Please wait patiently.

How to use Manual topology:

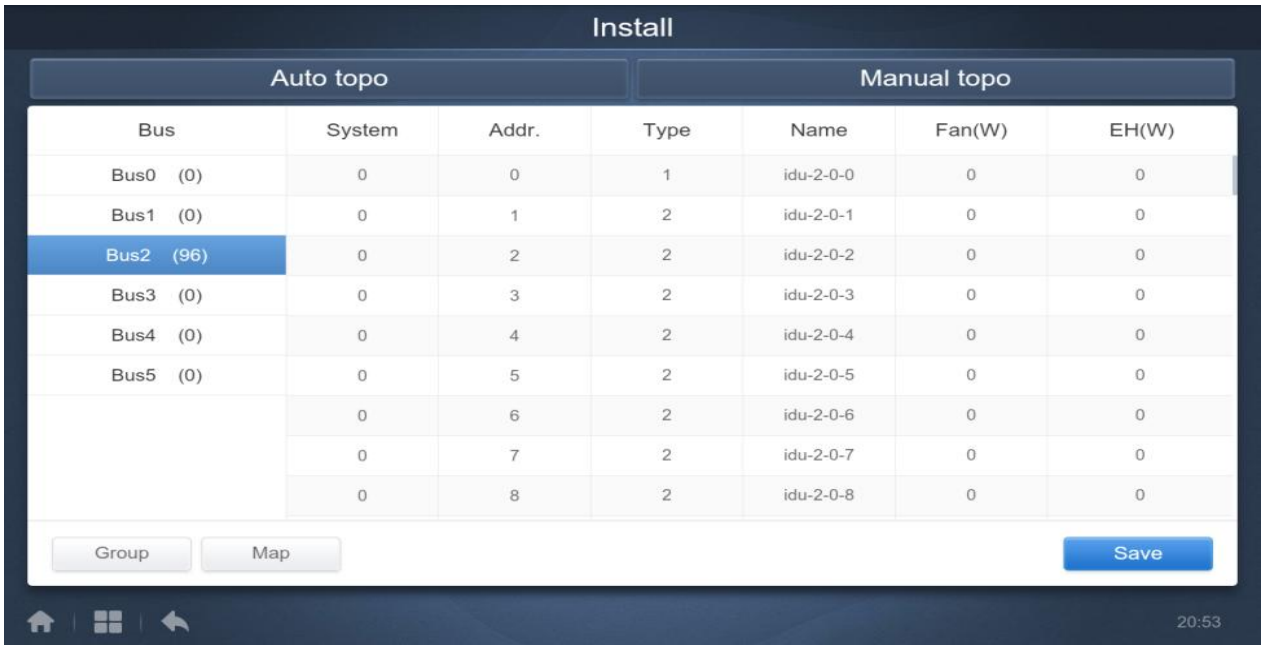
1. Write the Topology files
2. Store the Topology files locally on the computer
3. Click Manual Topo on the Installation page.
4. Select the completed topology files in the pop-up dialog box and start topology
5. After topology is completed, check the topology results

Important Points:

1. Refer to the topology file formats and examples which are discussed above.
2. Do not operate the gateway during this time to prevent topo failure
3. It takes about 7 minutes to complete the Install IDUs process. Please wait patiently.

9.4 Checkingthe Installation Results

After the installation process is completed, it should be shown as the picture below, the table would contain IDU, ODU and related information after successfully finishing the search.

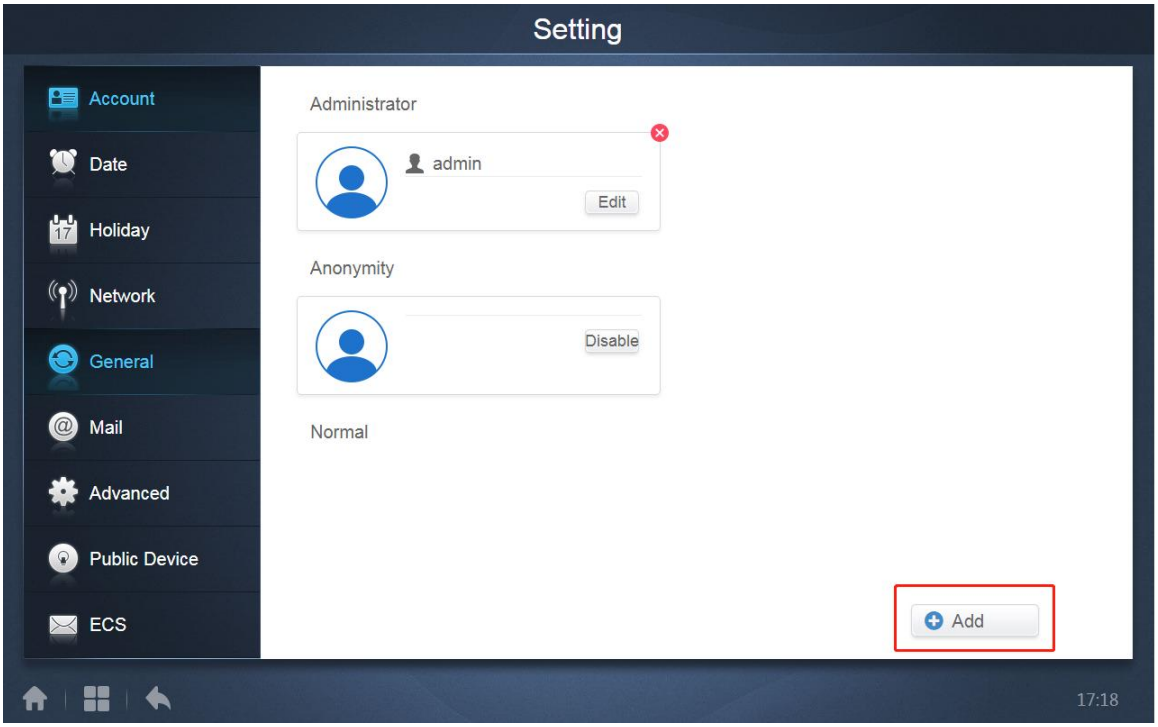


Important Points:

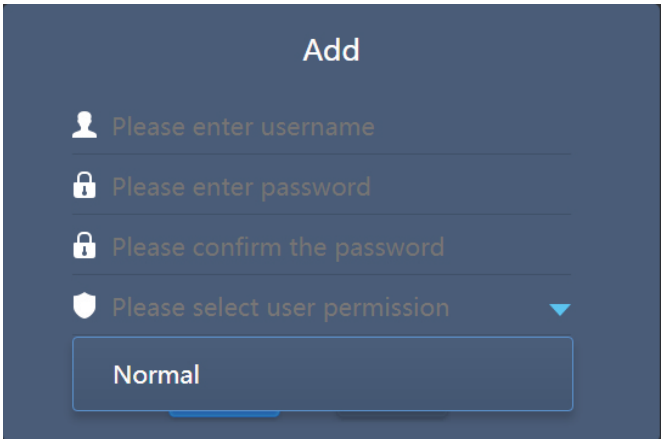
1. If no information is available, please check if the bus is correct or not. The table on the right only displays the information of the selected bus.
2. If no information is available for all the buses, check whether the ODU has started or not; whether the wires are normal and the wiring sequence at the port is correct or not; if not check whether the XYE line is closed or not.
3. If only part of the equipment information is available and IDU information is absent, check the PQE wires connecting ODU and IDU.
4. If ODU (slave) information is absent, please check the H1H2E wires connecting ODUs; If the entire system is absent, please check H1H2E wires connecting systems.

9.5 Set the Normal User Account

The administrator user generally has much more privileges than the normal user account including the capacity to add or remove normal users and check the outdoor unit configurations. So, these kinds of settings should not be available to the end user because they may make some changes in configurations which are not optimum for the outdoor unit. To avoid any such condition for occurrence, it is important to set a normal user account for the end user. The normal user account cannot change the ODU configurations. The various steps to set the normal user account have been enlisted as follows:



In the “Setting” tab of the website of IMMP-BAC(A), we need to select the “Account” tab and if you are logged in with Administrator account, clicking on Add can help to add the normal user account.



The above dialog box will get opened when we would click on the “Add” button. In the permissions column, the normal button needs to be selected to complete the setup for normal user account.

9.6 Power Meter Installation

To use the Energy Statistics function of the IMMPRO software, the energy meter should be connected to the outdoor units to monitor the energy consumed by the outdoor units which can be sent to the software and hence it can be used by the software to calculate the energy consumed by various tenants.

Three Models of Energy Meter are available from MDV, which are listed as follows:

Model	Current	Comment
DTS 634/636	Up to 60 A	Phase out
DTS634-F	Up to 100 A	Phase out
DTS343-3	Up to 100 A	

DTS 634/636, DTS634-F

DTS343-3

9.6.1 Wiring Instructions

At present there are two kinds of power meter wiring schemes in engineering:

1. A refrigerant system can be connected to three-phase digital power meter of low current only used by MDV (can connect to the external current transformer). The external current transformer power meter can be installed directly on the power of the air conditioner system bus, implement a refrigerant system with one meter.

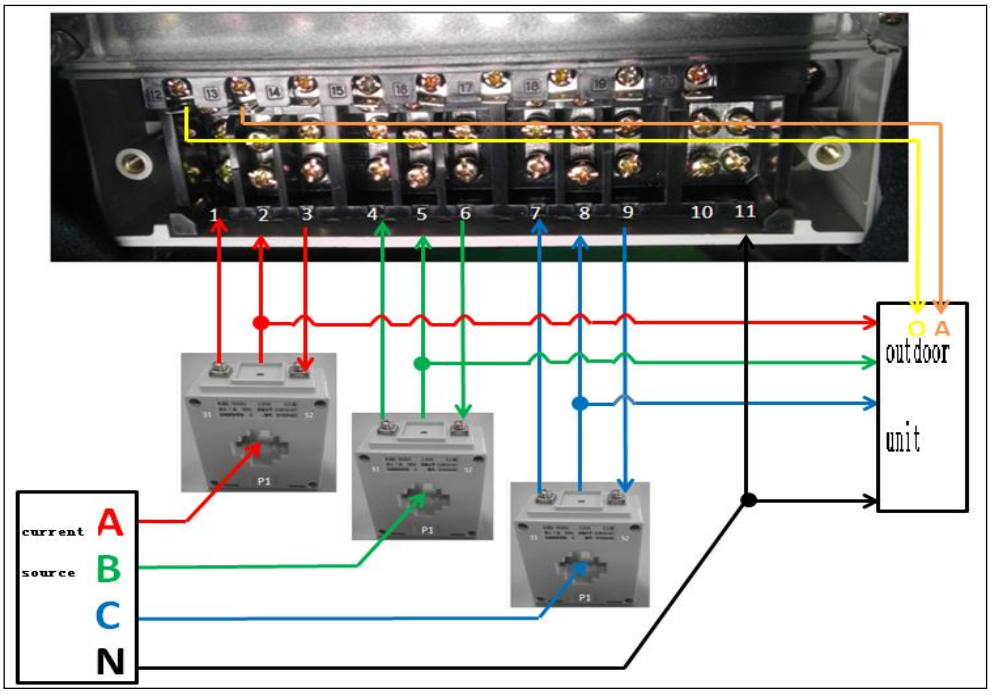
Code	Name	Overload current
DTS634-M (Phase out)	three-phase digital power (380V,50Hz,6A)(CHINT)(RoHS)	180A
BH-0.66-30IB	current transformer (150A/5A)	

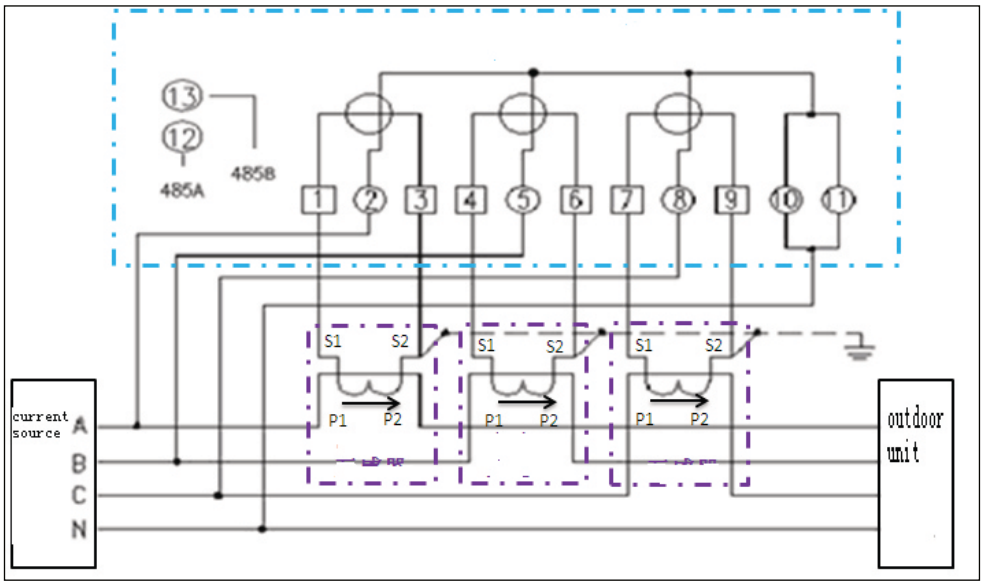
2. A outdoor unit connects to three-phase digital power meter of large current, at present there are three kinds of meter in using, details are as follows:

Code	Name	Overload current
DTS634-F (Phase out)	three-phase digital power meter (380V,50Hz,100A)(RoHS)	100A
DTS634/DTS636 (Phase out)	three-phase digital power (60A)(RoHS)	60A
DTS343-3	three-phase digital power meter (380V,50Hz,100A)(RoHS) (REACH)	100A

3. The wiring between current transformer and power meter

The power meter installed is DTS634-M. In the wiring diagram, the 1, 4 and 7 ports of the power meter need to connect to current transformer's S1 terminal; the 3, 6 and 9 ports of the power meter need to connect to current transformer's S2 terminal. The 2, 5 and 8 ports of the power meter need to connect to three-phase power supply. The 10 and 11 ports of the power meter need to connect to ground. In sure to safety, it's necessary to connect current transformer's S2 terminal before connecting the ground.





4. The connection of meter and outdoor unit

In the above figure 485A connects to the O terminal of power meter. 485B connects to A terminal of power meter. The length of communication wire should less than 100m. Communication cable is isolated to high voltage.

Important points:

(1) The power meter is customized by MDV, it has been set the percentage of 30:1, and if it is bought from the market, it will not normally use

(2) DTS634-M meters' current specifications:

1.5 (6) A is used with BH-0.66-30IB current transformer, and the current specifications will change into: 45 (180) A, so the power meter's maximum current is 180 A.

(3) We only offer DTS634-M power meter and BH-0.66-30IB current transformer. The connection line from current transformer output to the electricity meter should be offered by installer. We suggest that the line diameter should ≥2.5mm².

Current transformer of BH-0.66 30IB：

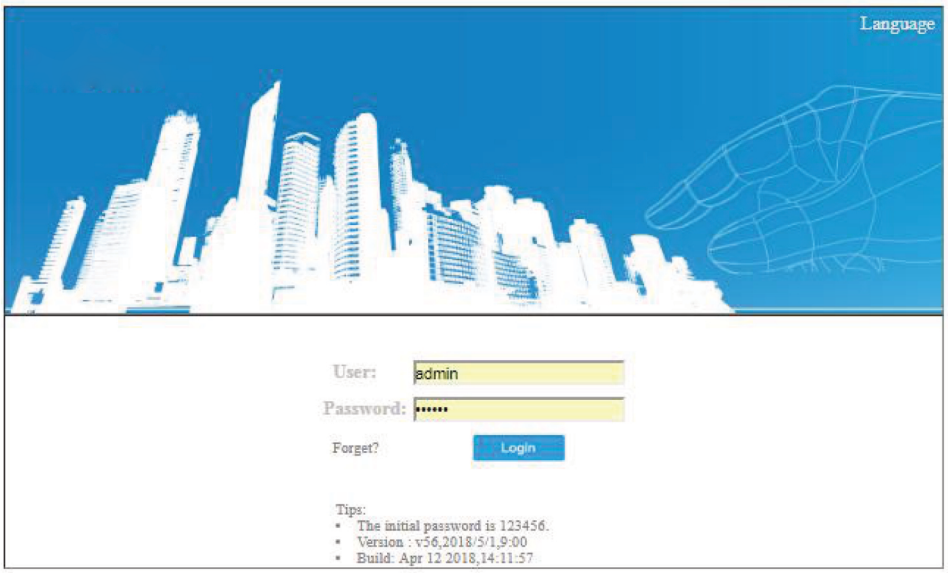
Face Back

10 Installation as BACnet BMS Gateway

In this section, we will give deep details when we use the IMMP-BAC(A) as a gateway to be used with the BACnet BMS software. The details given in the section 1 to 8 above should be followed as written, however for the installation as BMS gateway only, the section 9 can be skipped and the user can directly proceed to this section. In case, you want to use both the IMMPRO website as well as the BACnet BMS website of the IMMP-BAC(A), then the step 9 should be done after finishing step 8. Here, in this section we will discuss some basic details about the functions that are available on the BACnet BMS website of the IMMP-BAC(A) gateway. Also, are provided some miscellaneous important information that are required by the BMS engineer to couple the IMMP-BAC(A) with the BACnet BMS software. The website for the BACnet BMS section of IMMP-BAC(A) gateway is 192.168.1.8.

10.1 Login

Use Chrome 52.0 or latest versions only. Type 192.168.1.8 in the address bar to enter the login page. Enter the username and password and Click Login.



User:admin

Password:123456

10.2 IMMP-BAC(A) BACnetgateway miscellaneousinformation

In this section, we have provided some miscellaneous information about the BACnet section of the IMMP-BAC(A) gateway. This information will be required by the engineer installing the IMMP-BAC(A) gateway to connect with the BACnet BMS software.

10.2.1 Product Description:

The BACnet gateway monitors the outdoor and indoor VRF units via the RS485 interface and communicates with the building management system using the IMMP-BAC(A) interface.

10.2.2 Supported BACnetConsistencyCategories

The following BACnet consistency categories are supported by the IMMP-BAC(A) gateway.

Category 3	☑

10.2.3 Supported BACnetFunction groups

The following BACnet Function groups are supported by IMMP-BAC(A) gateway.

COV event initialization	☑	Device communications	☐
COV event response	☐		

10.2.4 Supported BACnetProtocol Application Services

The following BACnet Protocol Application Services are supported by the IMMP-BAC(A) gateway.

Applicable Service	Initiate a request	Execute the request
Verified COV notifications	☑	☐
Reserved for COV	☐	☑
Non-verified COV notifications	☑	☐
Read attributes	☐	☑
Read multiple attributes	☐	☑
Write attribute	☐	☑
Write multiple attributes	☐	☑
Device communications and control	☐	☑
Who-Has	☐	☑
I-Have	☑	☐
Who-Is	☐	☑
I-Am	☑	☐

10.2.5 Supported Protocol Object Categories

The following Protocol Object Categories are supported by the IMMP-BAC(A) gateway.

Object Type	Support?	Can this be dynamically created?	Can this be dynamically deleted?	Optional attribute	Writeable attribute
Analogue input	☑	☐	☐	_____	_____
Analogue output	☑	☐	☐	_____	_____
Analogue	☑	☐	☐	_____	_____
Binary input	☑	☐	☐	_____	_____
Binary output	☑	☐	☐	_____	_____
Binary	☑	☐	☐	_____	_____
Device	☑	☐	☐	_____	_____
Multiple input status	☑	☐	☐	_____	_____
Multiple output status	☑	☐	☐	_____	_____
Multiple status values	☑	☐	☐	_____	_____

10.2.6 Data Link Layer Options

The following data link layer options are available for the IMMP-BAC(A) gateway device.

☑	ISO 8802-3,10BASET

10.2.7 Supported Character Sets

The following character sets are supported by the IMMP-BAC(A) gateway device.

Support for multiple character sets does not imply that all these character sets are supported at the same time.

☑ ANSI X3.4

10.2.8 Special Functions

The following is the list of special functions for IMMP-BAC(A) gateway device's BACnet function module.

Segment request support	☑ yes	☐ no	Window size: **1476**
Segment response support	☑ yes	☐ no	Window size: **1476**

10.3 IMMP-BAC(A) BACnetBMSObject List

The following table describes the abbreviations used for different object types.

Object Type	Abbreviation
Analog Input	AI
Analog Output	AO
Analog Value	AV
Binary Input	BI
Binary Output	BO
Binary Value	BV
Multi-state Input	MI
Multi-state Input	MO
Multi-state Value	MV

10.3.1 BACnetobjectsfor Indoor units

The BACnet device for each indoor unit provides the following objects:

Object ID	Object Name	Current Value Description	R/W
AI 1	Room Temperature	Room Temperature (unit degreeC)	R
AI 7	Malfunction Code	Error Code(unit degreeC)	R
AI 8	Outlet Air Temperature	Outlet Air Temperature	R
AI 9	EXV Opening	EXV Opening	R
AI 10	Software Version	Software Version	R
AI 11	Indoor Type	Indoor type 0: 4-Way Cassette (4-WAY) 1: 4-Way Cassette (4-WAY) 2: Wall-mounted 3: Medium Static Pressure Duct (M-Duct) 4: Low Static Pressure Duct (L-Duct) 5: Air Handling Unit (AHU) 6: High Static Pressure Duct (H-Duct) 7: Compact 4-Way Cassette (COMPACT) 8: Ceiling & Floor 9: Floor Standing 10: Floor Standing 11: Fresh Air Processing Unit 12: Inverter Split AC 13: Heat Recovery Ventilator (HRV) 14: 1-Way Cassette 15: 2-Way Cassette 16: Console 17: High temperature hydro module (HTHM) 18: Fresh Air Processing Unit 20: Fresh Air Processing Unit 21: AHUKIT (return air control) 22: Floor standing 24: AHUKIT (discharge air control)	
AI 12	Indoor Horses	Indoor Horses	R
AI 13	T2A	T2A temperature in degree Celsius	R
AI 14	T2B	T2A temperature in degree Celsius	R
BI 2	Alarm Indication	Indicates the error status of the indoor unit 0- No error ; 1- Error	R
BV 1	On/Off Setting	On/Off Settings for Indoor units 0-OFF ; 1- ON. When ON is selected, the operating mode, fan speed and temperature settings are sent based on the records from the most recent time the indoor unit was used. If the indoor unit was turned OFF when the gateway first comes online, the default settings would be cooling at 24 degrees Celsius with low fan speed	RW
BV 4	Remote Control Lock Setting	0- Unlock Remote controller ; 1- Lock Remote controller	RW

BV 5	Controller Lock Setting	0- Unlock Wired CONTROLLER; 1- Lock wired controller	RW
MV 1	Mode Setting	VRF IDU: 1-OFF; 2-FAN; 3-COOL; 4-HEAT; 5-AUTO; 6-DRY HRV unit: 1-OFF; 2-FREE COOL; 3-HEAT EXCHANGE; 4-BYPASS; 5-AUTO;	RW
MV 2	Fan Speed Setting	1~7: 1~7 fan speeds; 8- AUTO ; 9 indicates that the fan is off(only used to show the status of the fan , cannot set the fan speed to off). For models with 3 fan speeds: 1,2 – Low fan speed ; 3-4 – mid fan speed ; 5,6,7- High fan speed)	RW
MV 3	Mode Limit Setting	The current value, “1”, indicates the mode limit is unlocked, “2” indicates the cooling mode is locked and “3” indicates the heating mode is loicked. For the indoor units that do not support mode lock, the setting for this variable is not valid.	RW
MV 5	Fan Lock/Unlock Setting	1~7: 1~7 – Lock Fan Speed; 8- Unlock. For models with 3 fan speeds: 1,2- Lock on low fan speed; 3-4: Lock on mid-fan speed. 5,6,7- Lock on high fan speed	RW
AV1	Temperature Setting	Temperature Setting, unit is degree ; range is 10~30.	RW
AV2	Dual Point (Cooling) Setting	Set cooling temperature in AUTO mode. The set cooling temperature for cooling mode must be greater than or equal to set heating temperature of AUTO mode. Otherwise, the gateway may automatically change the set cooling temperature to make its value as the same as the heating temperature. If non-automatic mode is used, this is equivalent to AV1.	RW
AV3	Dual Point (Heating) Setting	Set heating temperature in AUTO mode. The set heating temperature for heating mode must be less than or equal to set cooling temperature of AUTO mode. Otherwise, the gateway may automatically change the set cooling temperature to make its value as the same as the cooling temperature. If non-automatic mode is used, this variable is invalid.	RW
AV4	Cooling Temperature Limit Setting	The current value, “0”, indicates that the lower limit of cooling temperature is unlocked, while “17~30° C”indicates the lower limit of cooling temperature. For indoor units that do not support the feature to lock the lower limit in cooling mode, this setting for variable is invalid.	RW
AV5	Heating Temperature Limit Setting	The current value, “0”, indicates that the upper limit of heating temperature is unlocked, while “17~30° C”indicates the upper limit of heating temperature. For indoor units that do not support the feature to lock the upper limit in heating mode, this setting for variable is invalid.	RW
AV6	Swing Setting	0 - Maintain the current swing angel, 0 - Maintain the current swing angel, 1~5 - Swing angle 1-5, 6- Auto swing off, 7- Auto swing on	RW

R indicates that the object’s current value is read-only. W indicates that the object’s value can be written. “RW” indicates that the current value of a variable corresponds to the current status of the indoor unit and the value can be written to change the related status of the indoor unit.

Notes: Some models do not support all of the above parameters, please contact technical support engineer for details.For example: Indoor units in cooling only system do not support auto or heating modes,if auto or heating modes are required , the actual operating mode of the indoor units may not be the same as expected

10.3.2 BACnetobjectsfor outdoor units

The BACnet device for each outdoor unit provides the following objects:

Object ID	Object Name	Current Value Description/Notes	R/W
MI 1	Mode Status	Operating Mode for outdoor unit: 1-Off; 2- Reserved; 3-Cooling; 4-Heating; 5-Forced Cooling; 6-MasterCooling; 7-Master Heat; 8-Forced Heating	R
BI 1	On/Off Status	0-Off; 1-On	R
BI 2	Alarm Indication	0- No Error; 1- Error	R
BI 3	SV1	SV1	R
BI 4	SV2	SV2	R
BI 5	SV3	SV3	R
BI 6	SV4	SV4	R
BI 7	SV5	SV5	R
BI 8	SV6	SV6	R
BI 9	SV7	SV7	R
BI 10	SV8	SV8	R
BI 11	ST1	ST1	R
BI 12	ST2	ST2	R
BI 13	ST3	ST3	R
BI 14	SV8B	SV8B	R
BI 15	SV9	SV9	R
BI 17	HEATER1	HEATER1	R
BI 18	HEATER2	HEATER2	R
AI 1	Ambient Temperature	Ambient temperature in Celsius	R
AI 2	Compressor 1 Frequency	Compressor 1 Frequency in Hertz	R
AI 3	Compressor 2 Frequency	Compressor 2 Frequency in Hertz	R
AI 4	Compressor 1 Discharge Temperature	Compressor 1 Discharge Temperature in Celsius	R
AI 5	Compressor 2 Discharge Temperature	Compressor 2 Discharge Temperature in Celsius	R
AI 6	High Pressure	High Pressure for compressor in Bar	R
AI 7	Low Pressure	Low Pressure for compressor in Bar	R
AI 8	Malfunction	Error Code	R
AI 9	Fan 1 Speed	Fan Speed for Fan 1	R
AI 10	Fan 2 Speed	Fan Speed for Fan 2	R
AI 11	T3	T3 in degree celsius	R
AI 12	T3B	T3B in degree celsius(Reserved)	R
AI 13	Version	Software Version	R
AI 14	Outdoor Type	Outdoor Type	R
AI 15	Outdoor Horses	Outdoor Horses	R
AI 16	EXV1 Opening	EXV1 Opening	R
AI 17	EXV2 Opening	EXV2 Opening	R
AI 18	Exv3 Opening	EXV3 Opening	R
AI 19	Superheat	Exhaust superheat	R
AI 20	Compressor current 1	Compressor current 1	R
AI 21	Compressor current 2	Compressor current 2	R
BV 1	Emergency Stop	(Reserved) 0- Emergency Stop OFF; Emergency Stop ON	R

*R means the following value is read only

10.3.3 BACnetobjects for High Temperature Hydro Module

The BACnet device for each HTHM unit provides the following objects:

Object ID	Object Name	Current Value Description/ Notes	R/W
AV 50	Water Heating Temperature setting	Heating-water temperature setting, unit is °C, range is 25-80	RW
AV 51	Heating Temperature Setting	Heating temperature setting, unit is °C, range is 25-80.	RW
AV 52	Heating Temperature Lock	The current value, "0", indicates that the limit of the heating temperature is unlocked, "25~80°C" indicates the upper limit of the Heating temperature, "254" indicates the temperature non-adjustable.	RW
AV 53	Water Heating Temperature Lock	The current value, "0", indicates that the limit of the Heating-water temperature is unlocked, "25~80°C" indicates the upper limit of the Heating-water temperature, "254" indicates the temperature non-adjustable.	RW
AV 60	Water Inlet Temperature	Water Inlet Temperature in °C	R
AV 61	Water Outlet Temperature	Water Outlet Temperature in °C	R
AV 62	Water Tank Temperature	Water Tank Temperature in °C	R
AV 63	Error Code	Error code, see the next page	R
AV 64	Tf	Module Temperature in °C	R
AV 65	T2A	R410a circuit liquid pipe temperature sensor in °C	R
AV 66	T7	Suction Temperature in °C	R
AV 67	T7C	Discharge Temperature in °C	R
AV 68	Pe	Air Return pressure in Bar	R
AV 69	Pc	Discharge pressure in Bar	R
AV 70	EXV 1	EXV 1 open degree	R
AV 71	EXV 2	EXV 2 open degree	R
AV 72	Need	High Temperature Hydro Module need	R
AV 73	Power	Power	R
AV 75	Compressor Frequency	Compressor Frequency in Hz	R
AV 76	Software Version	Software Version	R
MV 78	Heating Lock	1 – Lock ON; 2 – Lock OFF; 3 - Unlock	RW
MV 79	Heating- water Lock	1 – Lock ON; 2 – Lock OFF; 3 - Unlock	RW
MI 56	Current mode	1 - Off; 4 – Heating;6- Water Heating	R
BV 90	Heating On/Off	0 - OFF; 1 - ON	W
BV 91	Water Heating On/Off	0 - OFF; 1 - ON	W

10.3.4 Object List for bus

The BACnet device for each bus line provides the following objects: Each bus has an “All Off Status” control point, control any one can close all the indoor units of whole gateway.

Object ID	Object Name	Current Value Description/ Notes	R/W
BV 1	All Off Status	1-ALL OFF	W

10.3.5 Error Codes

Error Code	Corresponding Error
0	No error
1~20	A0~AF,AH,AL,AP,AU
21~40	B0~bF,bH,bL,bP,bU
41~60	C0~CF,CH,CL,CP,CU
61~80	E0~EF,EH,EL,EP,EU
81~100	F0~FF,FH,FL,FP,FU
101~120	H0~HF,HH,HL,HP,HU
121~140	L0~LF,LH,LL,LP,LU
141~160	J0~JF,JH,JL,JP,JU
161~180	n0~nF,nH,nL,nP,nU
181~200	P0~PF,PH,PL,PP,PU
201~220	r0~rF,rH,rL,rP,rU
221~240	t0~tF,tH,tL,tP,tU
241~260	U0~UF,UH,UL,UP,UU
Reserved	

Notes:

1. A0~AF refers to A0, A1, A2, A3, A4, A5, A6, A7, A8, A9, AA, AB, AC, AD, AE, AF etc.

2. In cases where the error code displayed does not reflect the error code on the machine, the machine's actual error should be given priority. The specific meaning of the error code is based on the interpretation of the service manual.

11 First Time Installation Checklist

11.1 Installation Checklist as IMMPRO gateway

Process	Check Point
Connect the IDU and ODU with each other	Refer to the IDU and ODU respective installation menus
Connect the Power cable to IMMP-BAC(A)	The power cable is not supplied with IMMP-BAC(A). The IMMP-BAC(A) requires 24 V AC power supply. It should be purchased from outside market.
Connect the LAN cable	If it is connected directly to the computer, it is simply required to connect the LAN cable with computer.
IP Settings	The details about this is written above in 5 Pre-Installation Settings.
Auto Addressing & ENC4 Settings	The ODU needs to be set to Auto Addressing.[1]
Power on IMMP-BAC(A)	Switch on the Power button on IMMP-BAC(A) and provide power to IMMP-BAC(A) by the cable. *Upto this part the installation steps for IMMP-BAC(A) being used as BACnet or IMMPRO gateway is the same.
Login the IMMP-BAC(A) BMS website: 192.168.1.8:8000	The first login needs to be from administrator account, Username: admin Password: 123456
Install the IDUs	Details discussed in 9.3
Check Results	Details discussed in 9.4
Set Normal user account	An account with lesser permissions for the End User Details discussed in 9.5

[1]The ENC4 settings are required to distinguish several ODUs from different system from each other, this setting is specially required when high End devise like IMMPRO are being use

11.2 Installation Checklist as BACnet BMS gateway

Below is a flow chart of the check points that need to be kept in mind while installing IMMP-BAC(A) for first time.

Process	Check Point
Connect the IDU and ODU with each other	Refer to the IDU and ODU respective Installation Menus
Connect the Power cable to IMMP-BAC(A)	The power cable is not supplied with IMMP-BAC(A). The IMMP-BAC(A) requires 24 V AC power supply. It should be purchased from outside market
Connect the LAN Cable	If it is connected directly to the computer, it is simply required to connect the LAN cable with computer.
IP Settings	The details about this is written above in 5 Pre-Installation Settings
Auto Addressing & ENC4 Settings	The ODU needs to be set to Auto Addressing[1]
Power on IMMP-BAC(A)	Switch on the Power button on IMMP-BAC(A) and provide power to IMMP-BAC(A) by the cable *Upto this part the installation steps for IMMP-BAC(A) being used as BACnet or IMMPRO gateway is the same.
Login the IMMP-BAC(A) website: https://192.168.1.8	The first login needs to be from administrator account, Username: admin Password: 123456
Connect with the BMS software	Details discussed in 10.2 and 10.3

[1]The ENC4 settings are required to distinguish several ODUs from different system from each other, this setting is specially required when high End devise like IMMPRO are being used.

12 Miscellaneous information on IP settings

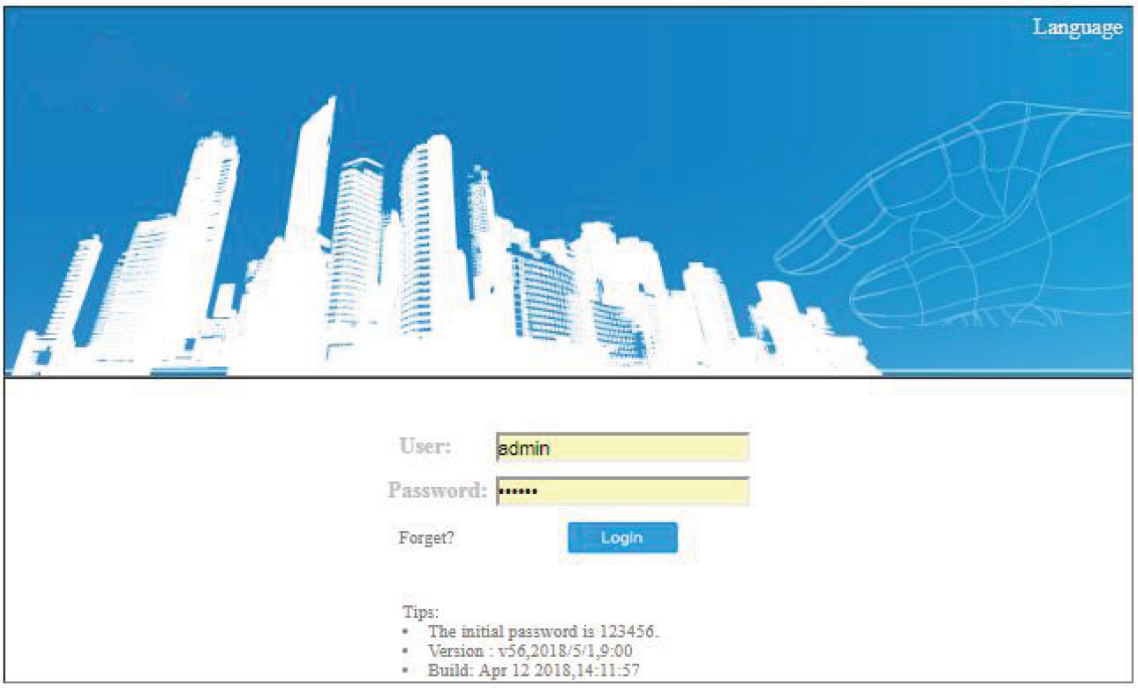
In case we need to connect more than one IMMP-BAC(A) gateways with one computer, we must make sure that the IPs of all the IMMP-BAC(A) gateways is different from each other. To make this happen, we must know how to change the IP of an IMMP-BAC(A) gateway. In this section, we will learn how to change the IP of the IMMP-BAC(A) gateway. Also, in the second part, we will learn how to reset the IP of the IMMP-BAC(A) hardware to its default value of 192.168.1.8. In case, the user forgets the IP of the IMMP-BAC(A) gateway, resetting the IP is very important so as to retrieve the information that is present inside the gateway

.

12.1 Changing the IP of the IMMP-BAC(A) gateway

The IP of the IMMP-BAC(A) gateway can be changed only in the BACnet software website of the gateway. There is option to change the IP of the gateway in the IMMPRO website also but, performing that way, the IP will not get changed, the user must follow the below listed steps in order to change the IP of the IMMP-BAC(A) gateway.

1. Open the BACnet (https://192.168.1.8) software website of the IMMP-BAC(A) gateway.

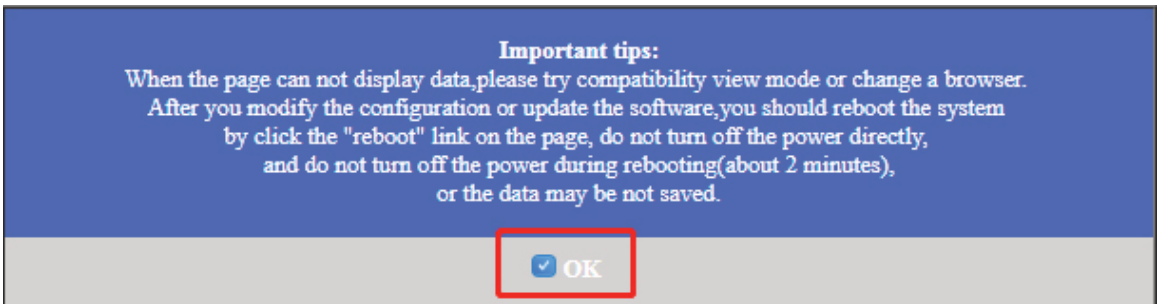


Username:admin

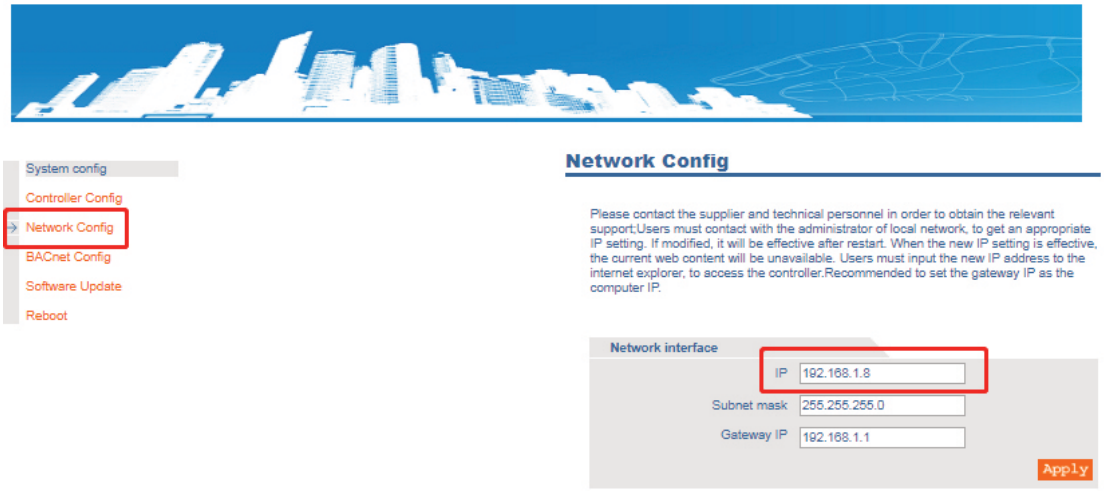
Password:123456

2. In the BACnet website of IMMP-BAC(A), click on “Configuration”.

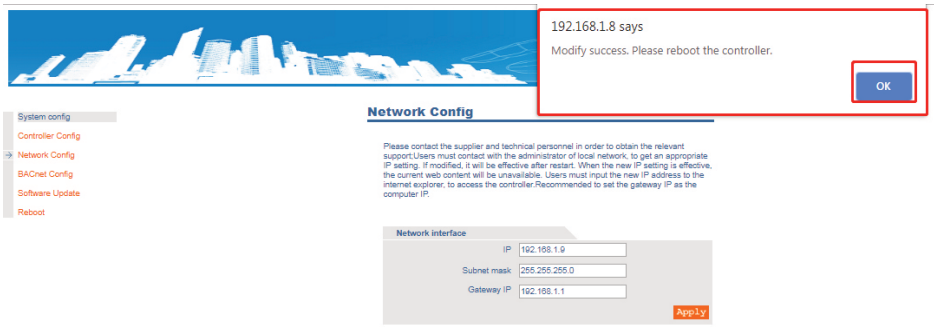
3. Click on “OK” in the dialog box that follows:



4. In the “Network Config” section, click on the IP of the gateway, from here the IP of the gateway can be changed. After you write down the required IP in the dialog box, click on “Apply” to save the changed IP



5. Click “OK” and restart the controller.



After restart, the controller will open from new IP address. For Eg. If we change the IP as 192.168.1.9 . After the change in the IP, the new websites for the BMS and IMMPRO sections of the controller would be as follows:

Website for IMMPRO gateway: 192.168.1.9:8000
Website for BMS gateway : https://192.168.1.9

Part 3
Functions

1 Functions as the IMMPRO gateway

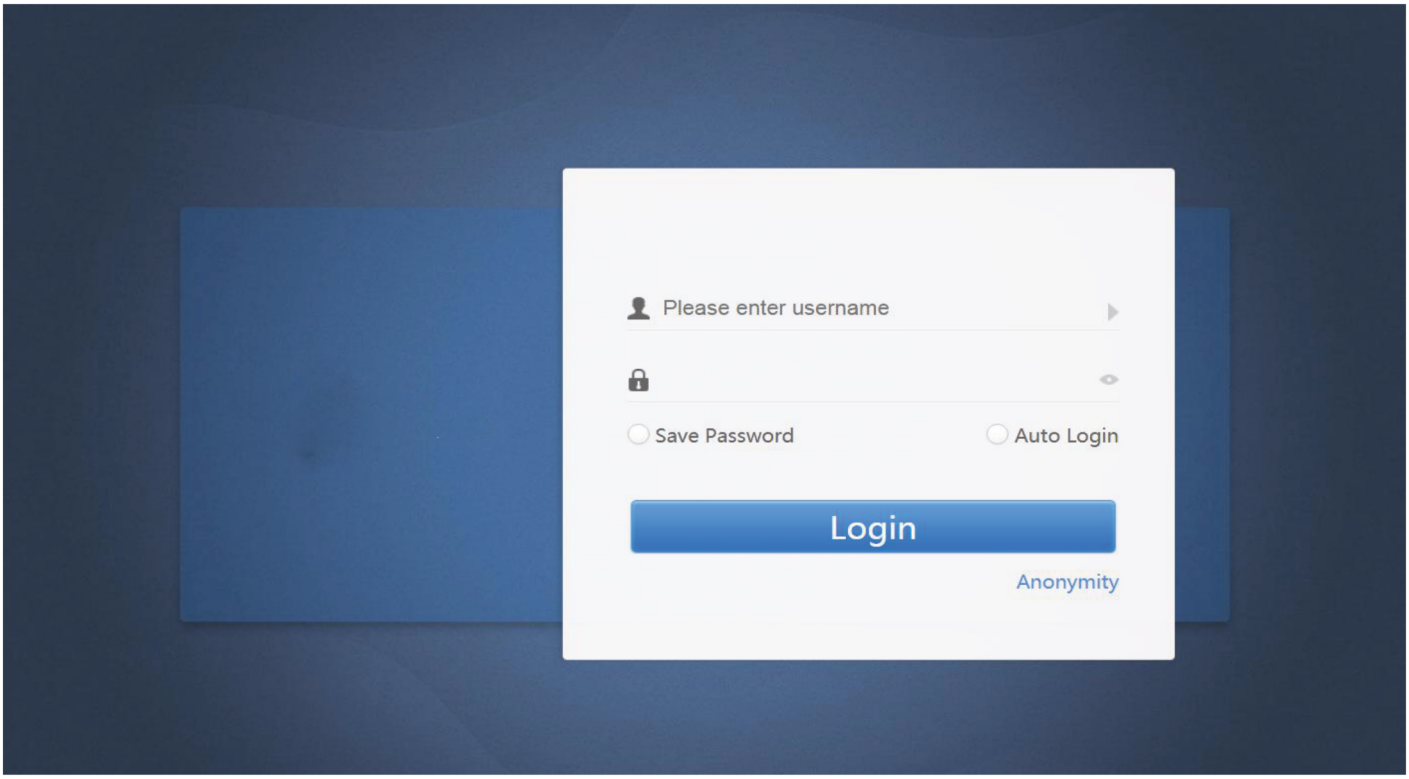
In this section, we have discussed the functions which are available on the IMMP-BAC(A) IMMPRO website (192.168.1.8:8000). The functions available on the IMMP-BAC(A) IMMPRO website are the same as the other IMMPRO gateways available by MDV.

1.1 Web Login

The default IP of the IMMP-BAC(A) IMMPRO wensite is 192.168.1.8:8000. The user just needs to put this in the website column of the web browser and the Login page will open up:

1.2 Login

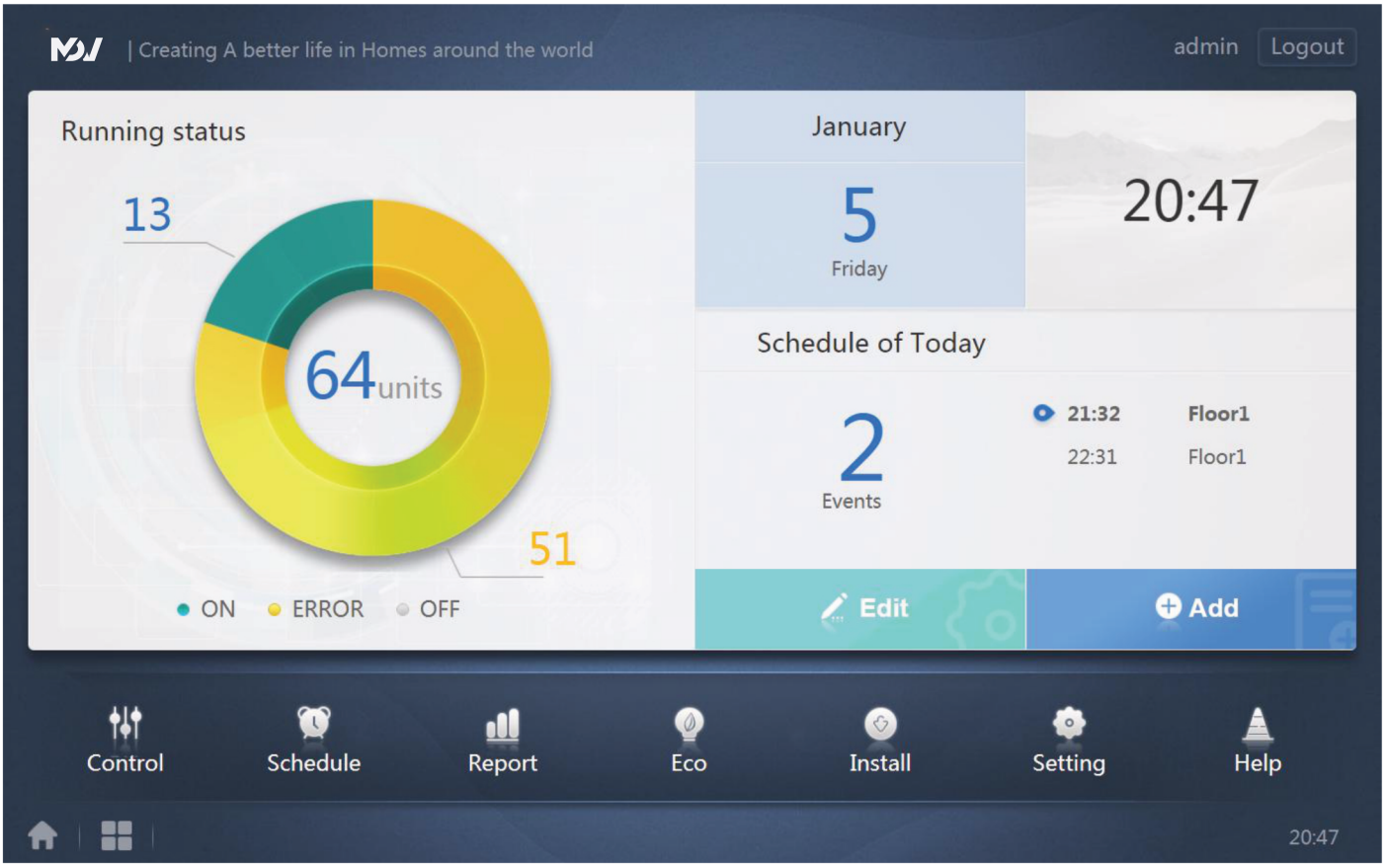
The default IP of the IMMP-BAC(A) is 192.168.1.8:8000. The user needs to open the website of the gateway through any of the browser (preferably Google Chrome 52.0 or above) and then needs to log in to the website as shown below. No special requirements are there regarding the operating system of the computer. If correct IP settings have been done, the website of the IMMP-BAC(A) can be opened by any of the browsers (preferred chrome 52.0 or above) available on the computer system.



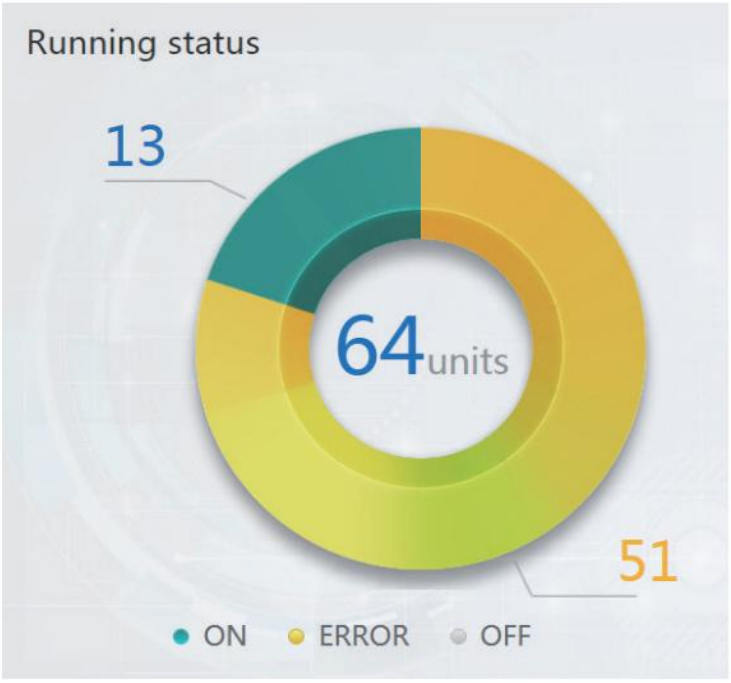
No	Item	Description
1	Please enter username	Place to enter the username
2	····· 123423	Place to enter the password
3	Save Password Save Password	Whether or not to save the password for current user account
4	Auto Login Auto Login	Whether or not to Auto Login the next time
5	Login	Click this button to login
6	Anonymity	Guest Login
7	admin	Default account name
8	123456	password

1.3 Home Page

Default software display page once the Login has been successful:



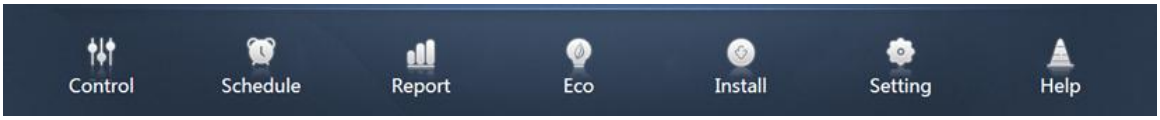
1.3.1 Overview of Indoor Units' RunningStatus



This section classifies the status of indoor unit into the following three categories:

No	Item	Description
1	ON	Running Units
2	ERROR	Error includes the units with error and offline
3	OFF	Standby

1.3.2 FunctionsMenu

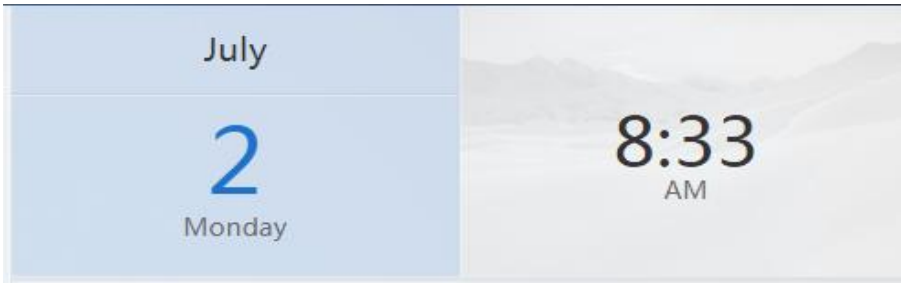


In this tab, navigation for all the functions is provided. It is present at the bottom of the homepage.

1.3.3 SpecialMenu

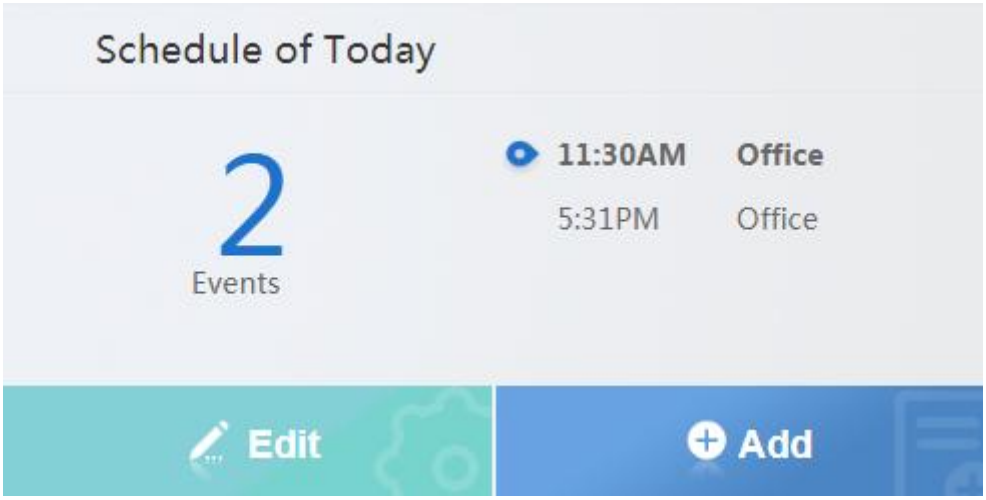
No	Item	Description
1		Back to home
2		Operating History

1.3.4 Date and Time



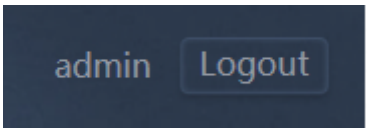
Also displayed on the home page is the date and time for the current day.

1.3.5 Schedulefor Today



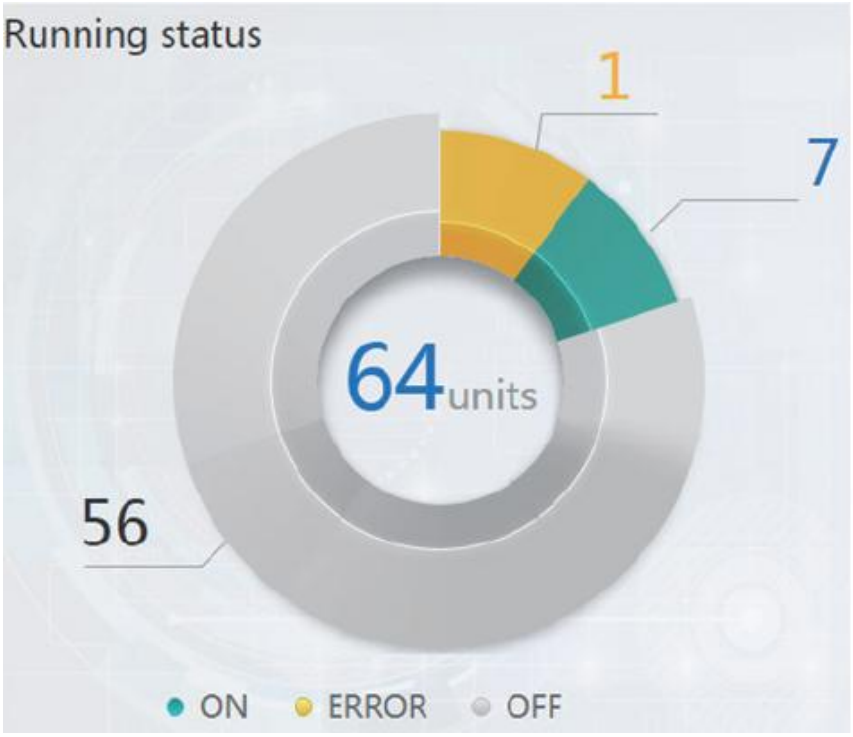
This tab shows the schedule which are waiting to be implemented today. Clicking on Add or Edit will take to the schedule main page.

1.3.6 Account

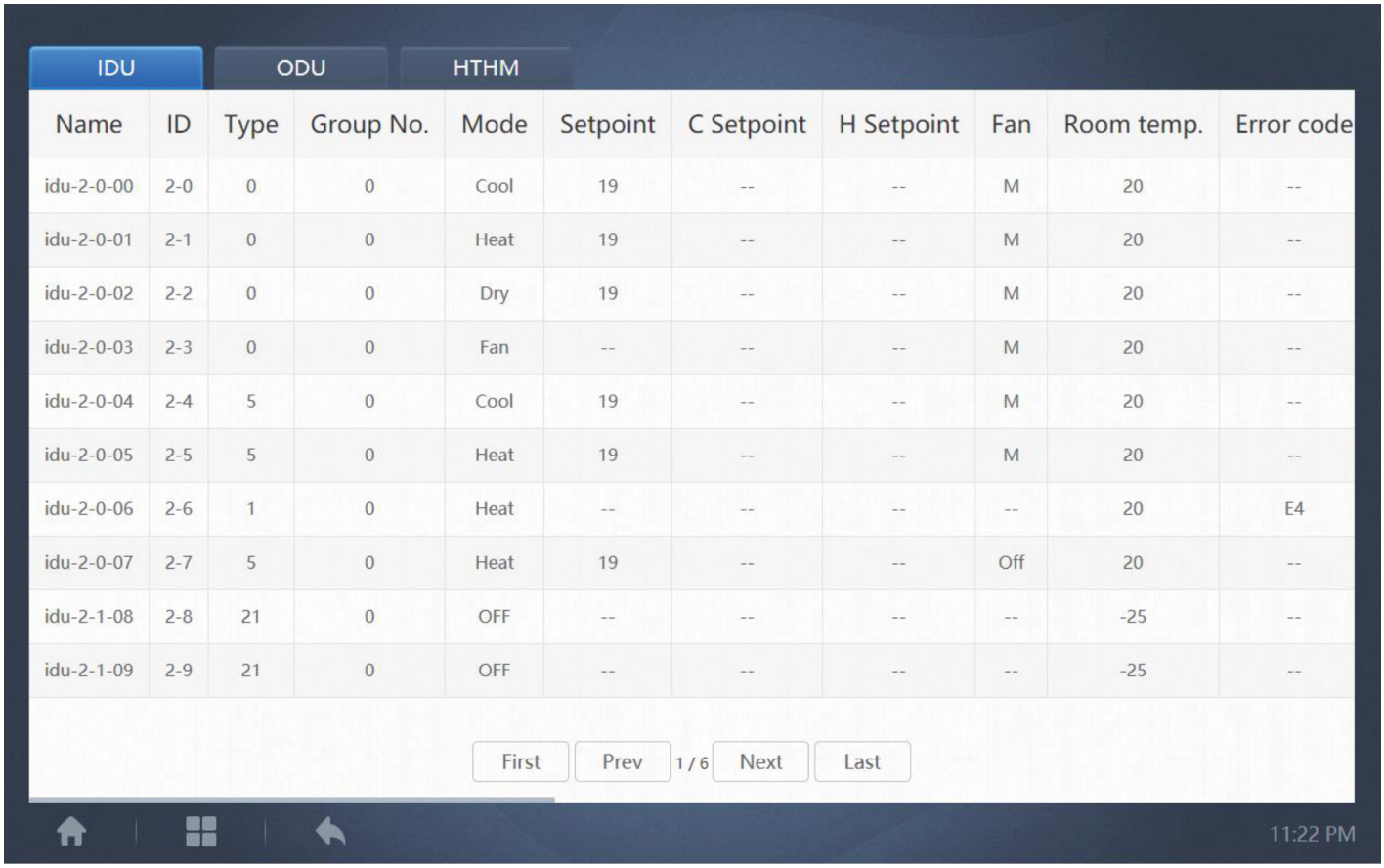


On the top right corner, is also shown the current account being used to Login into the IMMP-BAC(A). You can logout from here to change the account

1.3.7 Device Status List



Click on the pie chart of the indoor units' status statistics to get a complete list of detailed parameters of the indoor and outdoor units as reflected in the pictures below. Touch scroll horizontally to see all the parameters.



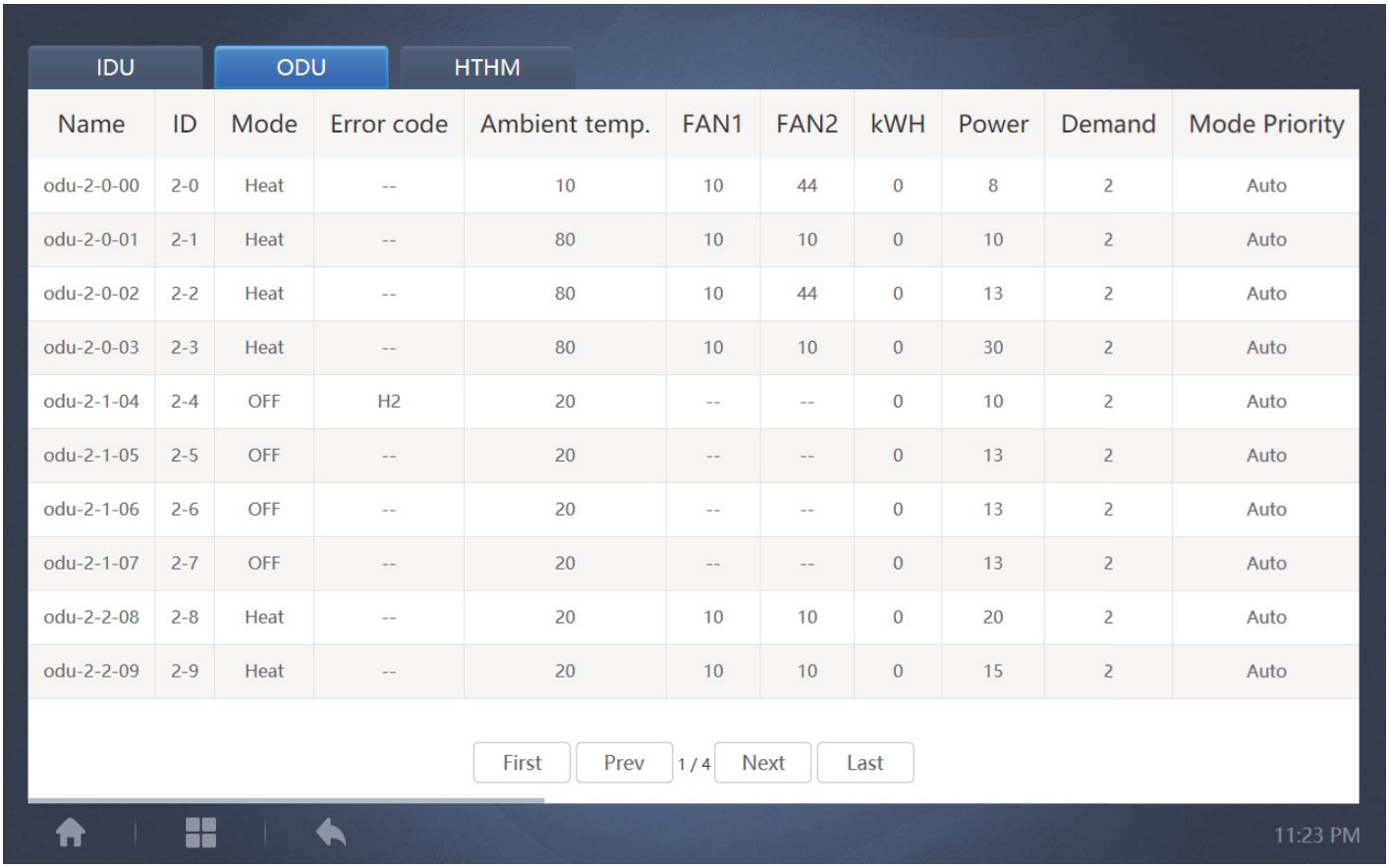
IDU ODU HTHM

Name	ID	Type	Group No.	Mode	Setpoint	C Setpoint	H Setpoint	Fan	Room temp.	Error code
idu-2-0-00	2-0	0	0	Cool	19	--	--	M	20	--
idu-2-0-01	2-1	0	0	Heat	19	--	--	M	20	--
idu-2-0-02	2-2	0	0	Dry	19	--	--	M	20	--
idu-2-0-03	2-3	0	0	Fan	--	--	--	M	20	--
idu-2-0-04	2-4	5	0	Cool	19	--	--	M	20	--
idu-2-0-05	2-5	5	0	Heat	19	--	--	M	20	--
idu-2-0-06	2-6	1	0	Heat	--	--	--	--	20	E4
idu-2-0-07	2-7	5	0	Heat	19	--	--	Off	20	--
idu-2-1-08	2-8	21	0	OFF	--	--	--	--	-25	--
idu-2-1-09	2-9	21	0	OFF	--	--	--	--	-25	--

First Prev 1 / 6 Next Last

11:22 PM

IDU Parameters



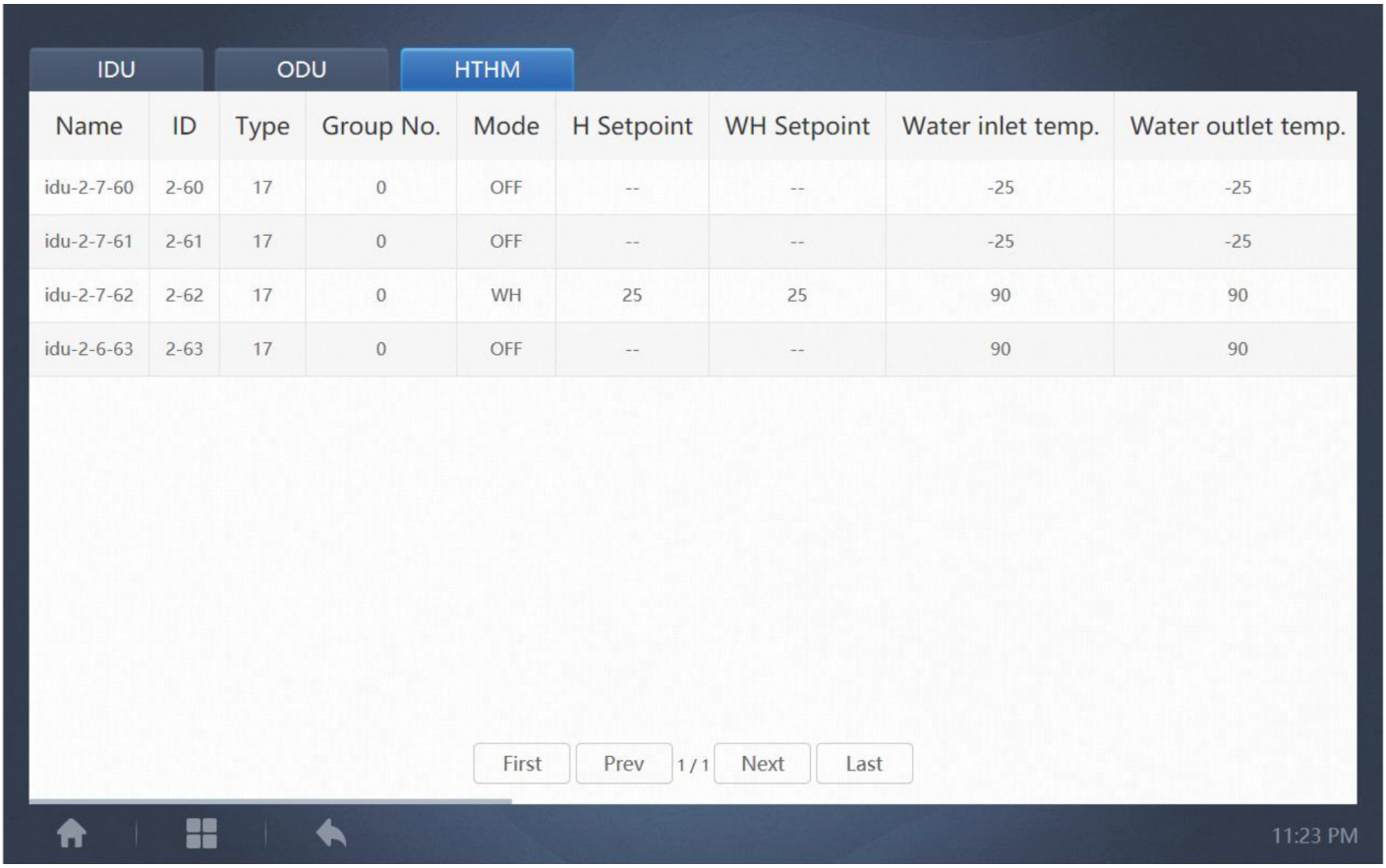
IDU ODU HTHM

Name	ID	Mode	Error code	Ambient temp.	FAN1	FAN2	kWH	Power	Demand	Mode Priority
odu-2-0-00	2-0	Heat	--	10	10	44	0	8	2	Auto
odu-2-0-01	2-1	Heat	--	80	10	10	0	10	2	Auto
odu-2-0-02	2-2	Heat	--	80	10	44	0	13	2	Auto
odu-2-0-03	2-3	Heat	--	80	10	10	0	30	2	Auto
odu-2-1-04	2-4	OFF	H2	20	--	--	0	10	2	Auto
odu-2-1-05	2-5	OFF	--	20	--	--	0	13	2	Auto
odu-2-1-06	2-6	OFF	--	20	--	--	0	13	2	Auto
odu-2-1-07	2-7	OFF	--	20	--	--	0	13	2	Auto
odu-2-2-08	2-8	Heat	--	20	10	10	0	20	2	Auto
odu-2-2-09	2-9	Heat	--	20	10	10	0	15	2	Auto

First Prev 1 / 4 Next Last

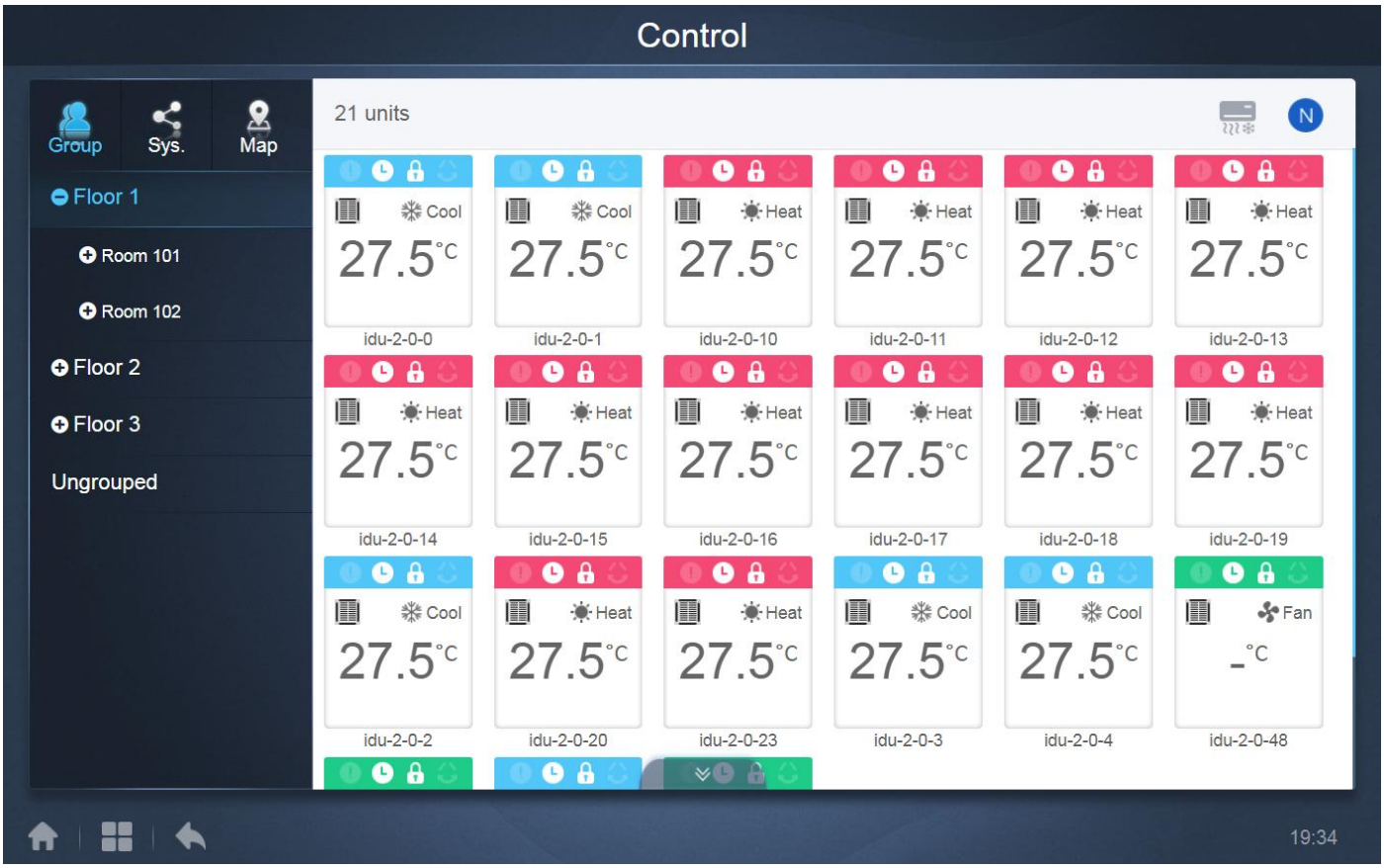
11:23 PM

ODU Parameters



High Temperature Hydro Module Parameters

1.4 Control



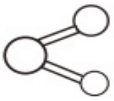
Select "Group" to view information of the corresponding indoor unit on the right. A series of icons are displayed,and the details are as follows:

1.4.1 IconsDescription

General Icons

View Scheme

These 3 Icons on the extreme left of the Control Interface screen are responsible to change the viewing scheme that is to view as per group/system/map. The map function is not available for IMMP-BAC(A)

Function	Inactive	Active
Indoor Unit View - Group		
Indoor Unit View- System		
Map(This function is not available for IMMP-BAC(A))		

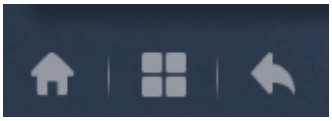
Sorting display

These keys are present on the top right side of the interface

Function	Inactive	Active
Sort by mode Auto, Cool, Heat, Dry, fan, Off, Error, Offline		
Sort by name		

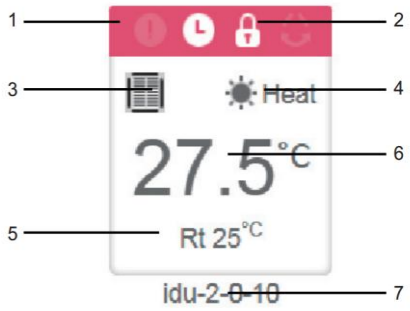
Navigation keys

These keys are present on the bottom left side of the Interface



No	Item	Description
1		Back to home
2		Operating History
3		Return to previous page

Indoor Units Icon Description

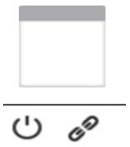
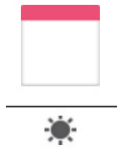


Sr. No.	Description
1.	The colors here represent the operating modes. The details about the colors is provided in the Table of Basic Mode Images
2.	Indicators (in order from left to right): error, schedule, lock, swing. Icon is white when active, such as the lock indicator in the above figure
3.	Displays the corresponding device model.
4.	The icons here represent the operating mode. The details are provided in the table of basic mode images
5.	Ambient Temperature
6.	Set Temperature
7.	Name can be changed at the “Install” page

*Note: The error code shown in the Indoor Unit on the old platform is different from the error code shown in the nixie tube display of the indoor unit.

Function	Active	Remarks
	White	Error
	White	Schedule
	White	Lock
	White	Swing

Mode Description:

Mode	Color & Icon	Icon
Off, Error, Offline	Grey	
Auto	Dark Blue	
Cool	Light Blue	
Heat	Red	
Fan	Green	
Dry	Orange	

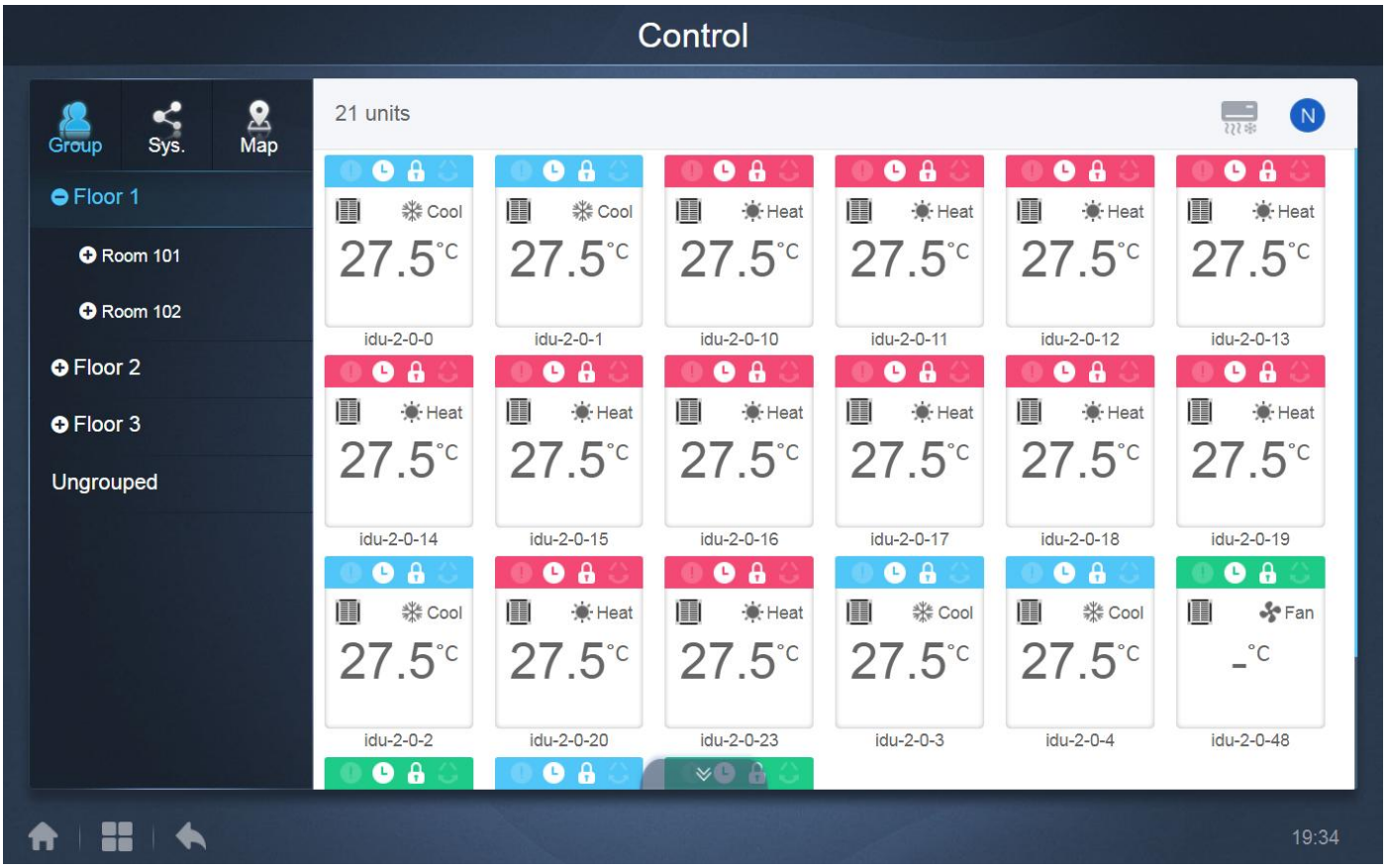
Indoor Unit Type Description

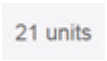
Codefor Manual Topology document	IDU Type	Icon Shown
0	Old IDU	
1	4-Way Cassette (4-WAY)	
2	Wall-mounted	
3	Medium Static Pressure Duct (M-Duct)	
4	Low Static Pressure Duct(L-Duct)	
5	Air Handling Unit (AHU)	
6	High Static Pressure Duct (H-Duct)	
7	Compact 4-Way Cassette (COMPACT)	
8	Ceiling & Floor	
9	Vertical Type Concealed	
11	Fresh Air Processing Unit	
12	Inverter Split AC	
13	HRV	
14	1-Way Cassette	
15	2-Way Cassette	
16	Console	
17	HTHM	
21	AHUKIT (return air control)	
22	Floor standing unit	
24	AHUKIT (discharge air control)	
/	IDUs in Wired Controller	

1.4.2 Indoor Unit View- Group

This function shows the various indoor units which are present in various groups created by the user. Along with the created groups, also is present a default “Ungrouped” where all the Indoor units which have not been assigned any group are placed.

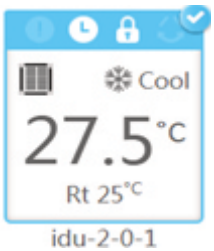
Once a group is selected, all the indoor units present in that group are displayed on the right. The top right menu, gives the option to sort the units according to name or mode.



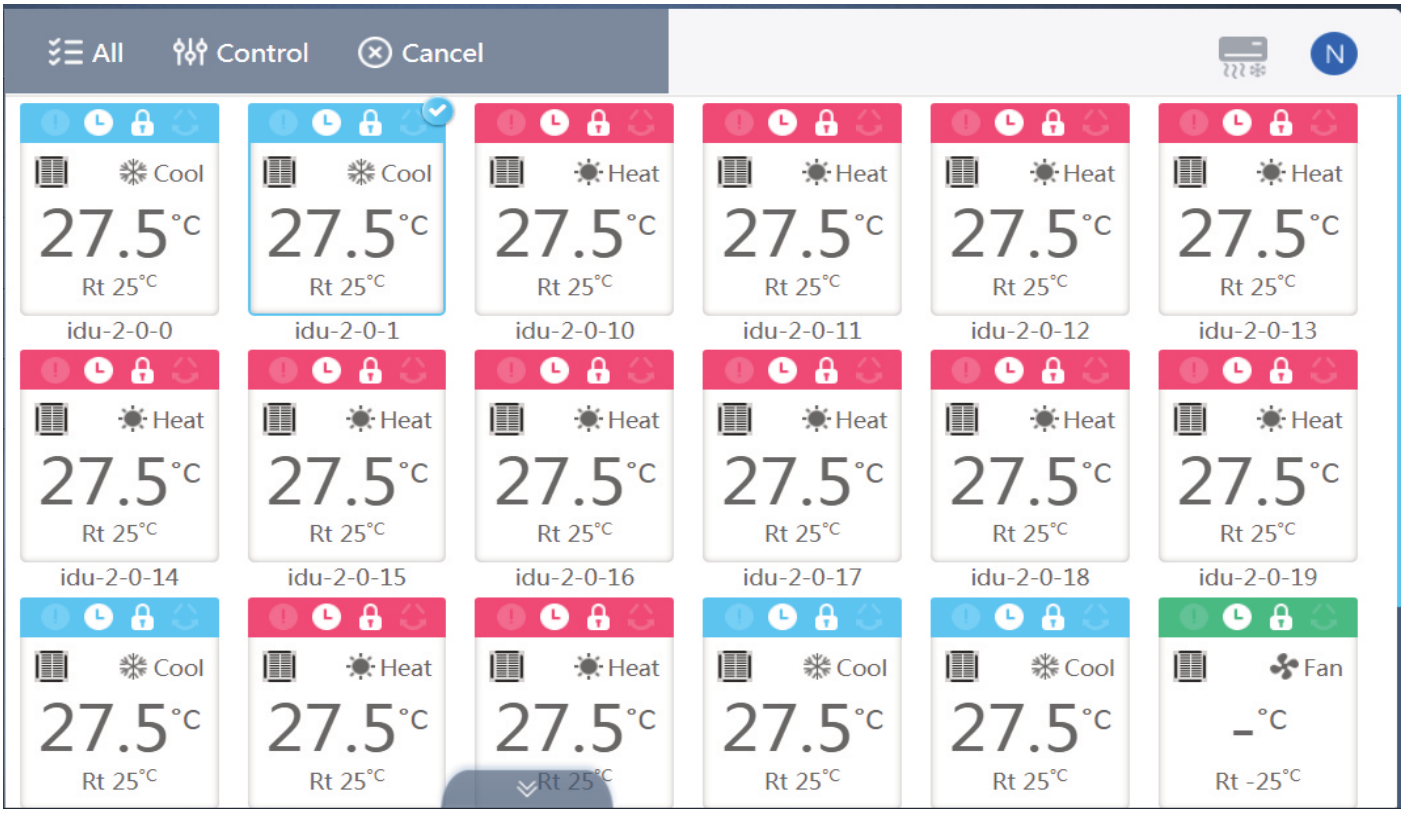
The top left corner  shows the number of indoor units in the group.

General Controls of Indoor Unit

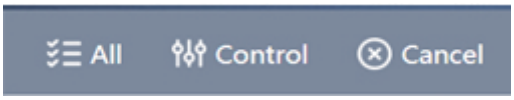
Tap to select the indoor unit and change its status to “selected”. At the top left corner, you would see “All”, “Control” and “Cancel”. Tap to select an indoor unit, and it is now selected, tap again if you want to deselect the unit;



The “tick” on the top right means that the corresponding IDU has been selected for controlling



Top Menu Buttons

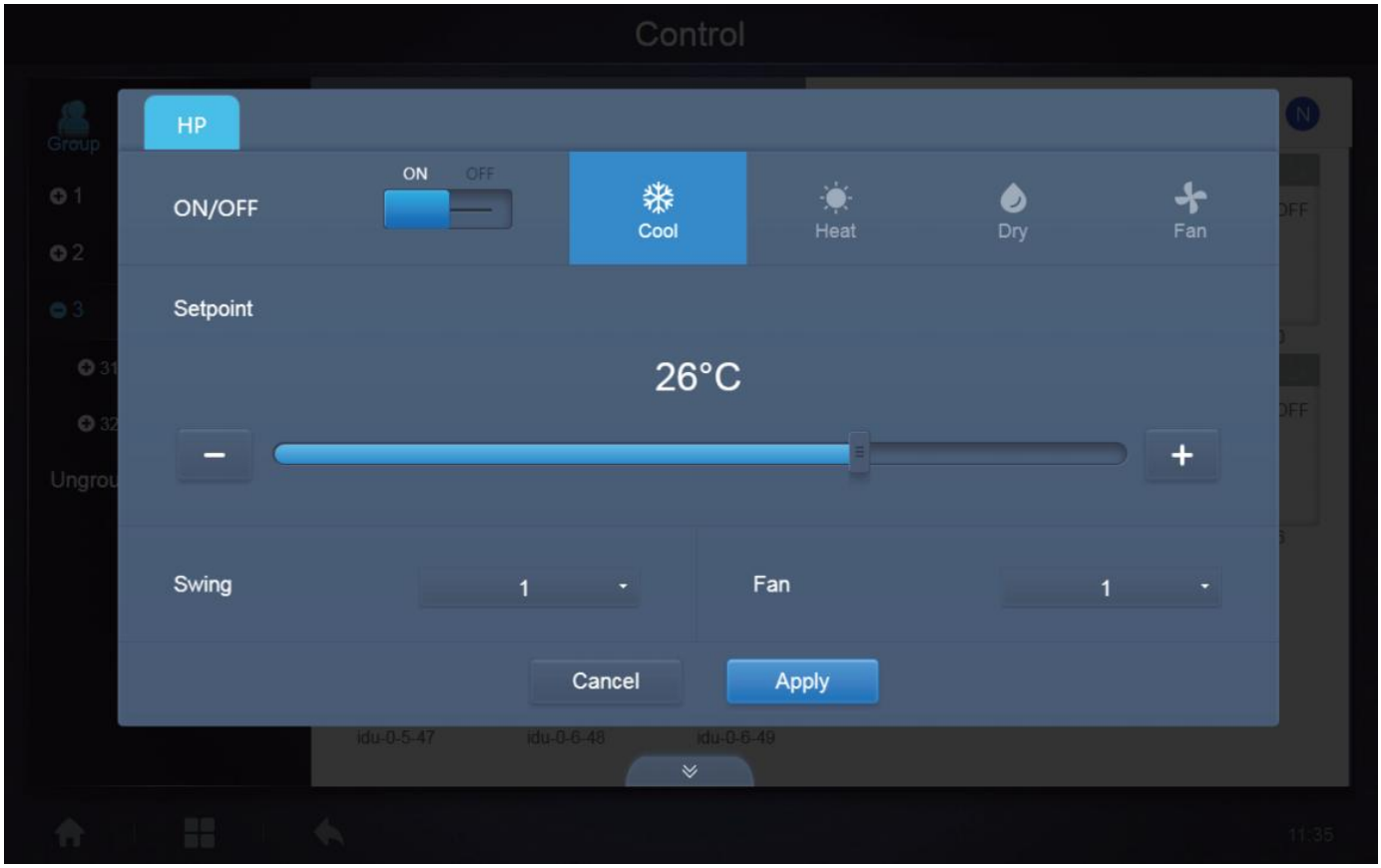


Tap "All" to select all the indoor units in this page.

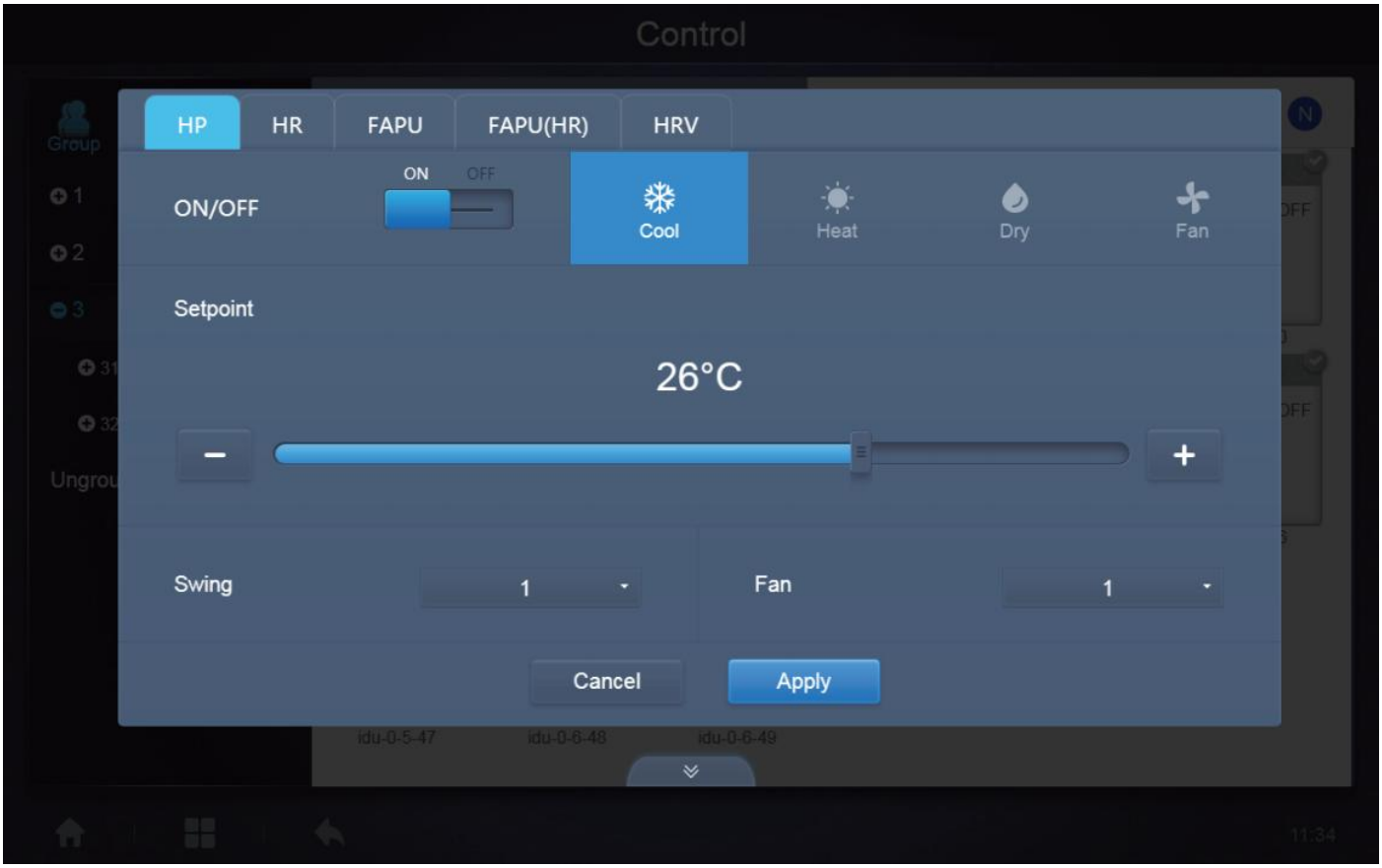
Tap "Cancel" to cancel the selection for all indoor units;

Tap "Control", and you will get the following control window:

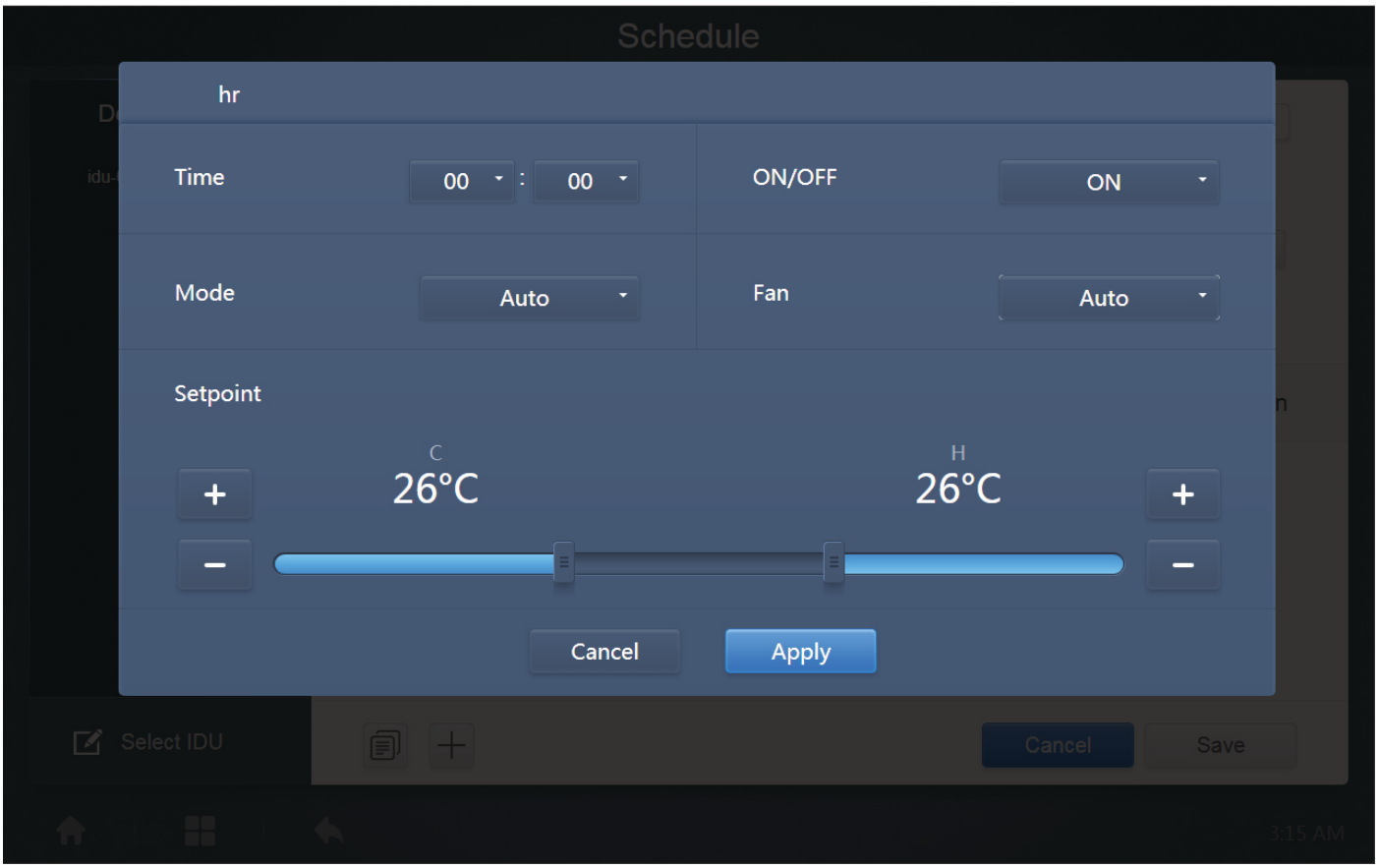
Tap the icon on the bottom of the screen to open the control command

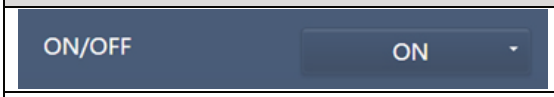
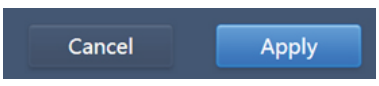


When simultaneously controlling multiple indoor units:



Auto Mode Display



Icon	Description
	To switch ON or OFF the Indoor Unit
	To select the Operating Mode for the Indoor Unit
	To set the Temperature for the indoor Unit, two set points are available in the Auto Mode and only one set point is available in Non- Auto Mode
	It is to change the Swing of the Indoor Unit
	This setting is to change the fan speed for the Indoor unit
	"Apply" It will save the adjusted settings "Cancel" All the adjusted settings would be lost and Indoor Unit would run according to previous settings

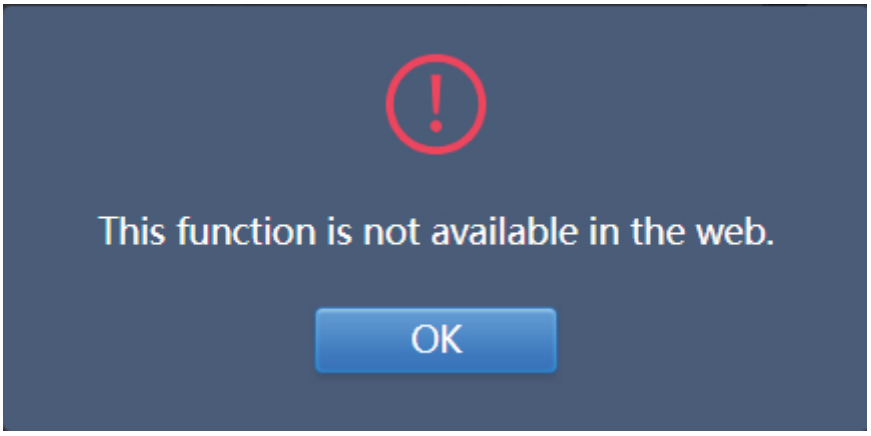
1.4.3 Indoor Unit View – System

This is also similar to “Group Navigation”, except that the system (instead of the groups) is on the left. System name is default and cannot be changed. In this type the, Indoor Units are displayed according to the systems from which they come.

1.4.4 Indoor Unit View- Map

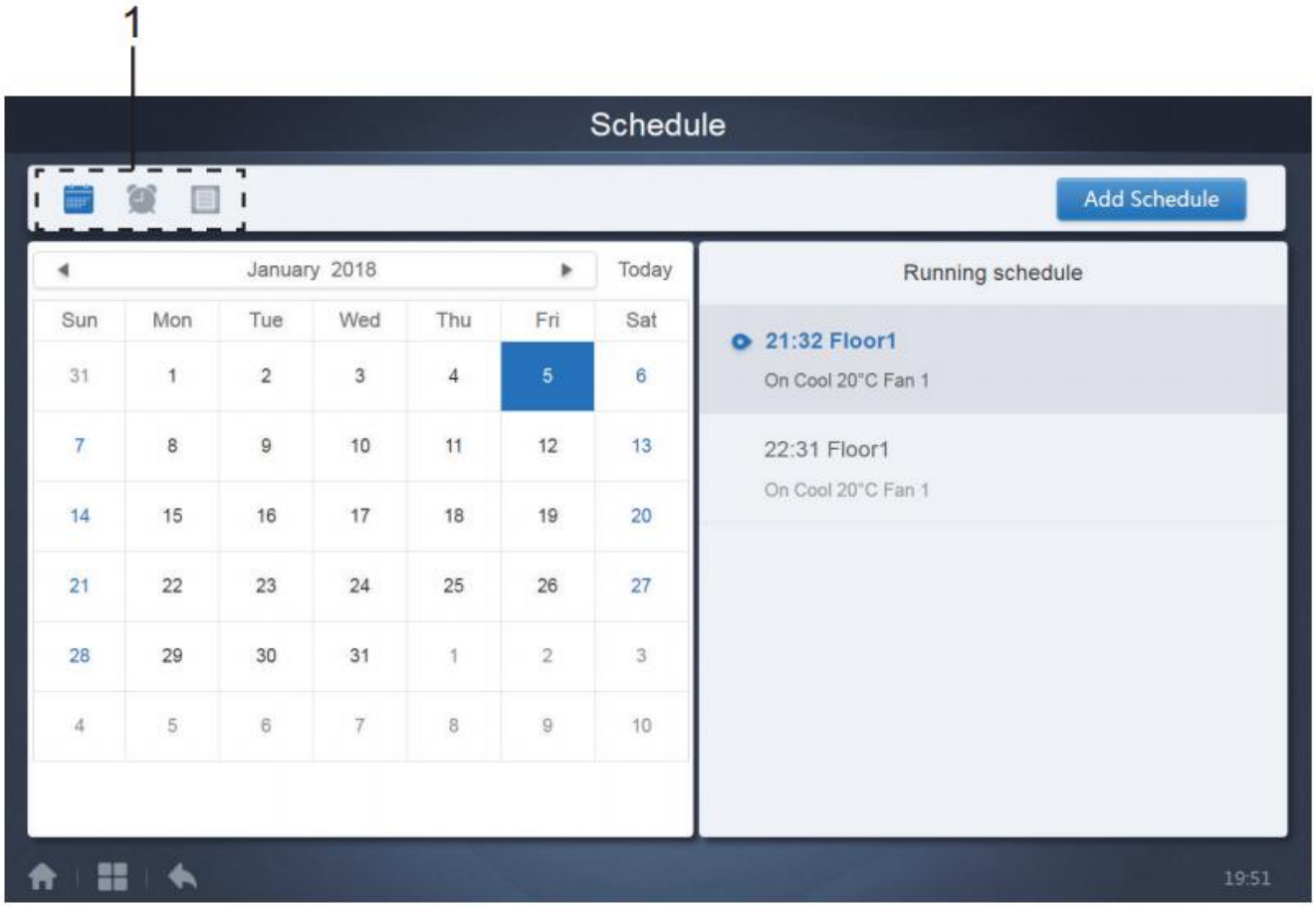
This function Is not available for IMMP-BAC(A)

On clicking on the Map Icon, the following dialog box will be shown on the screen.

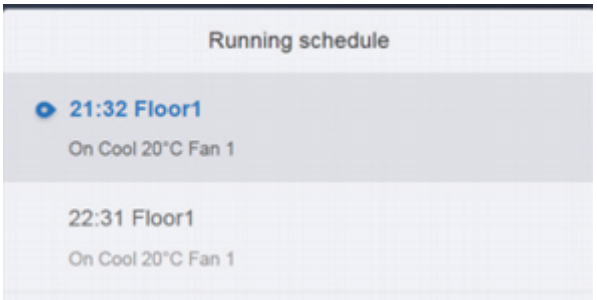


1.5 Schedule

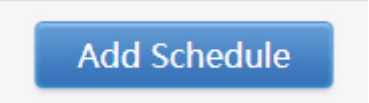
Once we have tapped the “Schedule Icon” at the Home page to go to the function module, the following display would be there. This is the Homepage for the Schedule function.



Sr. No.	Function
1	From left to right, the respective corresponding options to display the schedule plans are: 1. Calendar View (based on dates); 2. Plan View (based on plans); 3. Device View (based on devices); Tap the corresponding icon to go to the respective schedule view. Default is the calendar view.



It will show the Schedule, currently being implemented

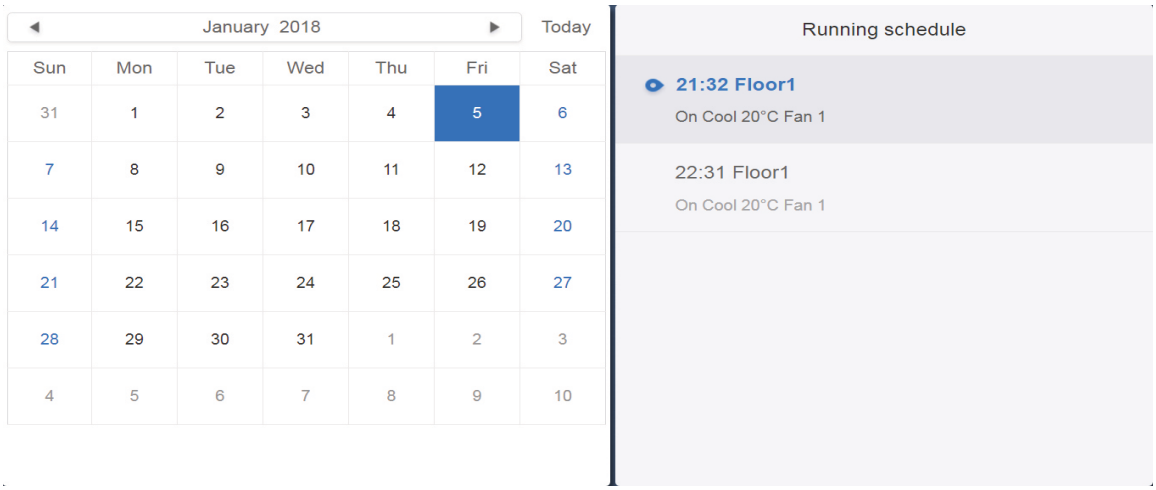


This tab is used to add new schedules

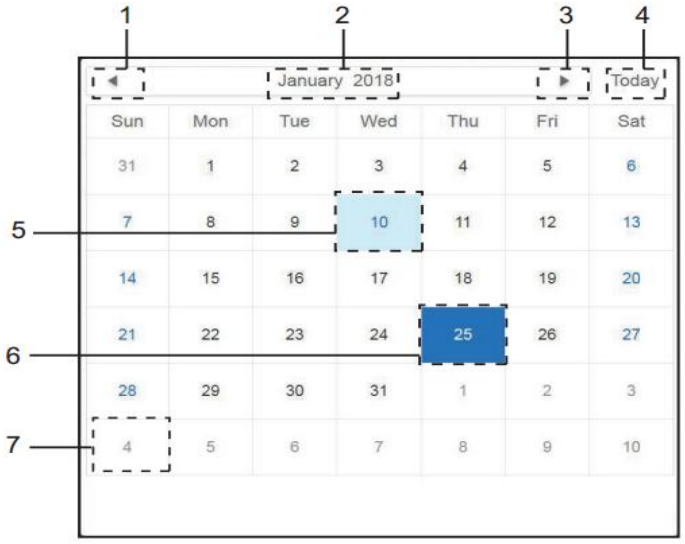
1.5.1 ScheduleView Types

Calendar View

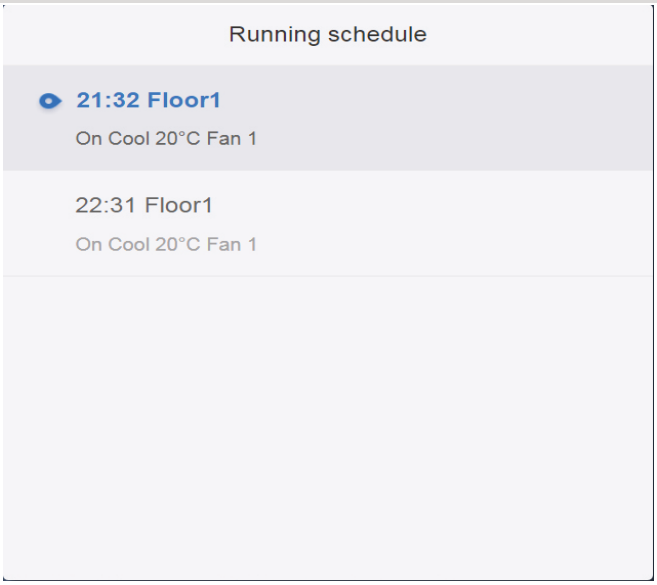
The calendar view is used to display the schedules present according to the various dates. The user can click on any of the dates and the schedule related to that day would be displayed



Description



No	Function
1	Tap to shift the calendar to the display of previous month
2	Displays the year and month information of the current date
3	Tap to shift the calendar to the display of the next month.
4	Tap to quickly jump to the month that today's date belongs to and select today's date
5	Today's date that has not been selected(Light blue Background). Tap to select this date.
6	Date Selected(Dark Blue background)
7	The grey numbers are dates not in the month shown now. Tap to jump to the month to which that date belongs to



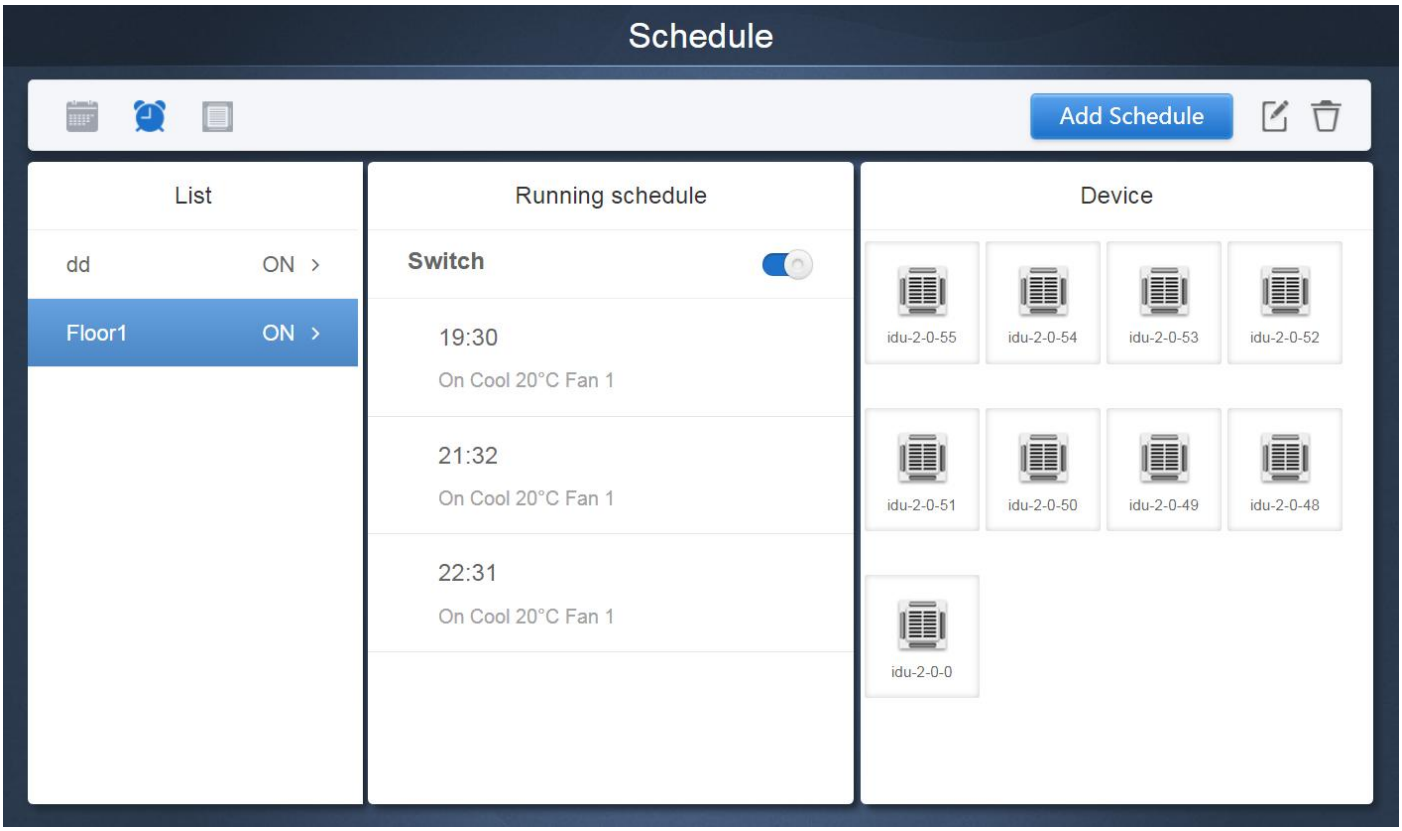
Schedule view (Right Side)

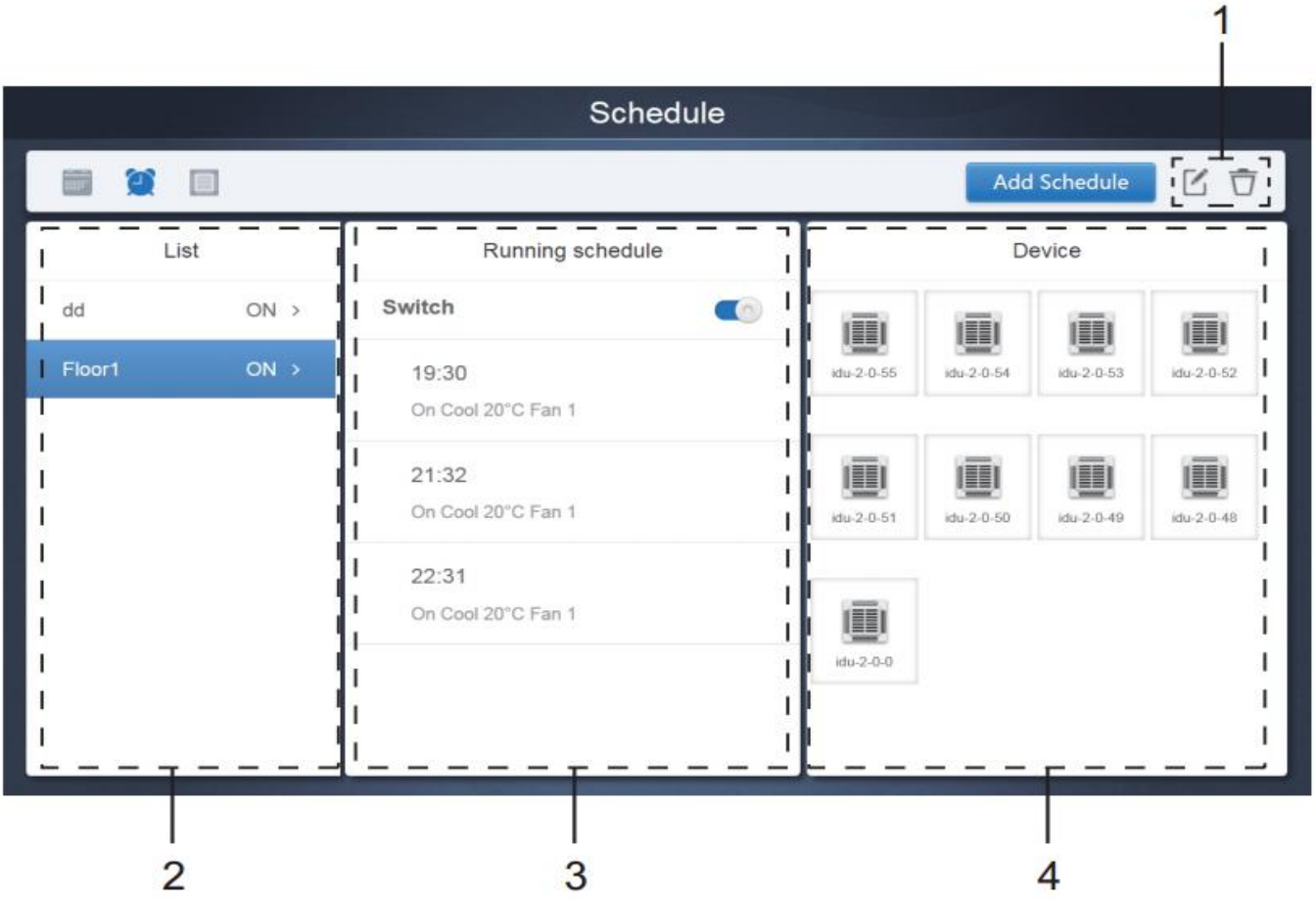
The schedule page only shows scheduled tasks that have not been performed for the selected date (arranged in the order of implementation time). The displayed information is as follows

1. Time
2. Schedule Name
3. Details of the executed command (On/off, mode, temperature set point, fan speed)

Plan View

Tap the second icon to view the schedule by plan as shown in figure below.

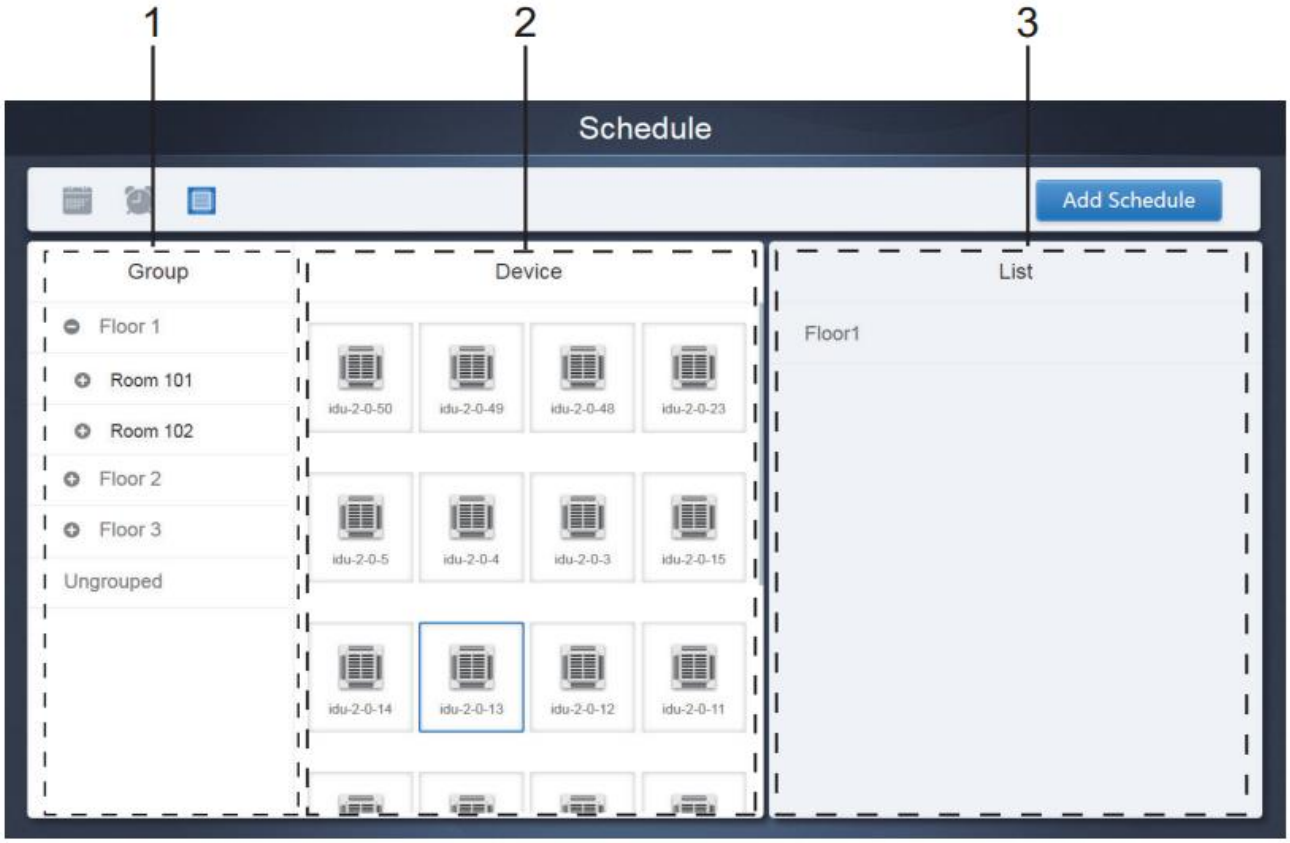




No	Function
1	Tap the left icon to go to the schedule editor. Using this the current schedule being used can be edited. Tap the right icon to delete the selected schedule.
2	The schedules are arranged in order of their time created. Tap to select the schedule you need. Selected schedule has a blue background color. The schedule name is on the left of the schedule bar, and the status (ON/OFF) of the schedule is on the right.
3	Shows all the timings for the selected schedule. Use the On/Off slider to perform on/off operations on the schedule. All the events on the dates of the schedule that has been turned off are not implemented, and the status "OFF" is displayed on the schedule bar. The schedule will not come into effect until it is turned on again.
4	Shows all the indoor units associated with the schedule.

Device View

Tap the third icon to go to the device view

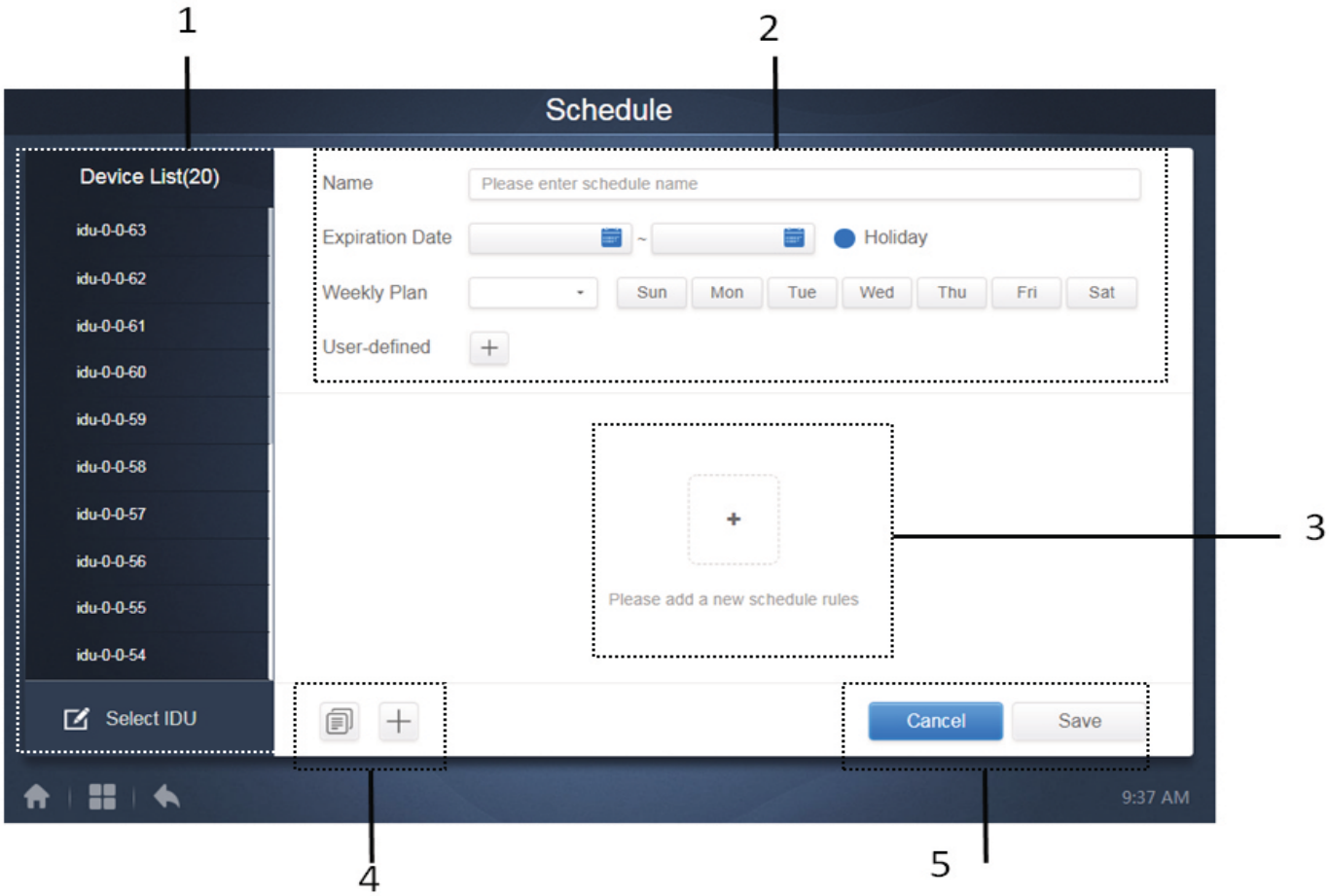


The page is divided into three sections.

1. Group list: this makes it easy to locate the device quickly. Tap "+" to expand the group, and "-" to minimize the group. All the IDUs in the selected group are displayed in the second column. Tap "Ungrouped" to view devices that have not been grouped.
2. The second column is a list of all the devices in the selected group;
3. The third column is the list of schedules, and displays all the names of all the schedules associated with the selected device.

1.5.2 Add Schedule

This interface is common for all kind of Schedule Views, calendar, device and Plan; It is used to add new schedule commands.

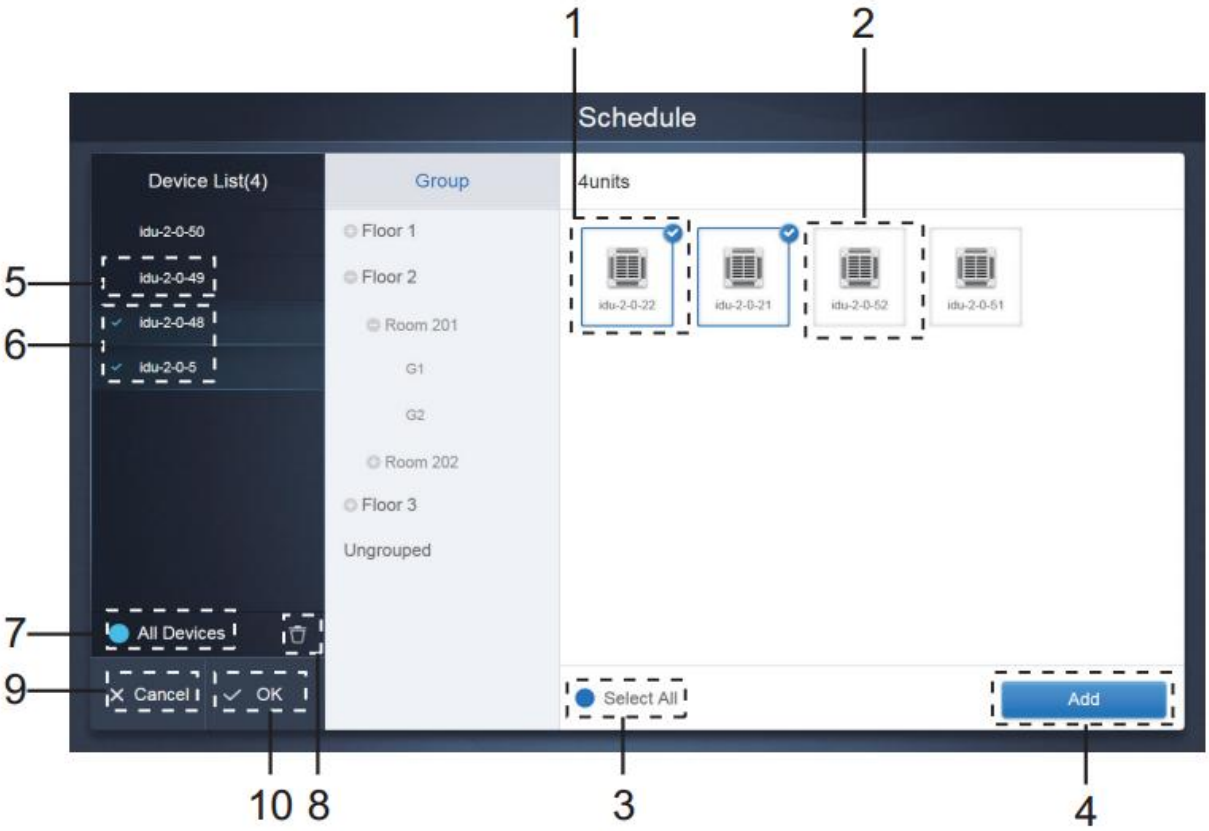


No	Function
1	The device list displays all the devices related to the schedule. Tap to select and add the IDU. Details shown below
2	Settings related to the schedule name and effective date, holidays, weekly plan and user defined dates can be edited here
3	This is used to add new schedule commands in the corresponding schedule, when empty. If already some schedule commands have been added in the schedule those commands would be displayed here as a list.
4	Copy will copy the schedule commanded added before with an Increment of one minute. “+” Icon is used to add new schedule commands
5	Cancel and Save ; it is used to cancel or save the corresponding schedule edits. If there are incomplete data for the Save command, you will receive an error message.

Add Device

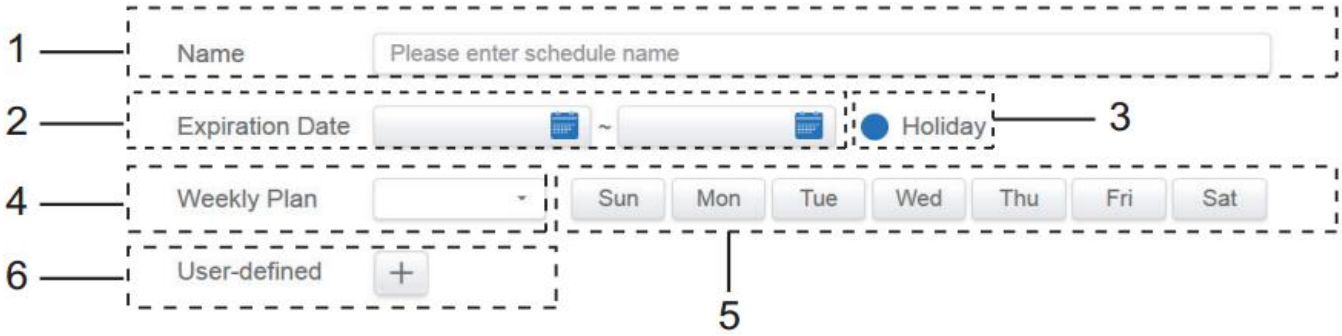
This interface would be shown up on clicking on the Select IDU tab on the previous page. The user can simply click on the devices being shown in the right side of the display and after clicking on “Add”, the following devices would be added to the corresponding schedule.

A detailed description of this function has been discussed in the table below:



No	Function
1	Devices waiting to be selected are displayed in the rightmost area, and these are the devices that have not been added to the selected subgroup. "1" is a selected device and its top right corner is marked with .
2	"2" is a device that has not been selected. Tap the unselected device to select the device. Tap again to deselect the selected device.
3	Tap to activate "Select All". is an active status for this selection. After activation, all the devices waiting to be selected in the group are selected. Tap again to deselect all. Manually cancel the selected status of a few devices after "Select All" has been activated. Will not cancel "Select All". Tap again to cancel the "Select All" option
4	Tap to add the selected device for the corresponding schedule
5	Displays the device that has been added for the corresponding schedule. You can tap to select this operation. “5” is a device that has not been selected, tap to select it
6	Displays the device that has been added. You can tap to select this operation. "6" is a selected device, tap to deselect it. Left of the selected device is marked with .
7	Tap to activate "Select All". is an active status. After activation, all the devices waiting to be selected in the group are selected. Tap again to deselect all. Manually cancel the selected status of a few devices after "Select All" has been activated. Will not cancel "Select All". Tap again to cancel the "Select All" option.
8	Clicking this will delete the device from the list of selected devices for the corresponding schedule and as a result the respective device would go back to right side of the display in the list of Non-Selected devices.
9	Clicking it will cancel all the changes made and the schedule would remain as it is as was before doing the edit.
10	Save and Exit would save the corresponding changes.

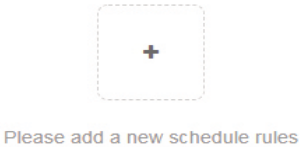
Date Settings



No	Function
1	Tap the input box to enter a name for the schedule. Maximum length is 80 English characters (40 Chinese characters). Note that system is unable to save the name if it contains the following symbols: ([`~!#$^&*()=|{}':;,\.<>/…?~！ ￥… （） ——【】 ‘’： “”。， 、？ ； 《》])
2	Tap in the white space to select the corresponding starting and End dates for the schedule.
3	Check the blue icon on the left next to Holiday to activate the holiday exception function which is to carry out all the plans in the schedule during the holiday period. The icons that are checked are active.
4	Quick select for the weekly plan. Select the particular day to implement the plan for the day. If the day falls on a working day (Mon to Fri), the schedule for the day is implemented on the day itself.
5	Manual option for weekly plan. Tap the date to activate or deactivate it. Blue indicates active status, while white indicates inactive status.
6	You can add a custom date to the schedule as an individual date. Tap the "+" sign to add a date each time, and you may add up to 5 dates. Tap once to select and add the date. Tap "x" at the top left corner to delete this date. Tap the date in other areas to deselect it

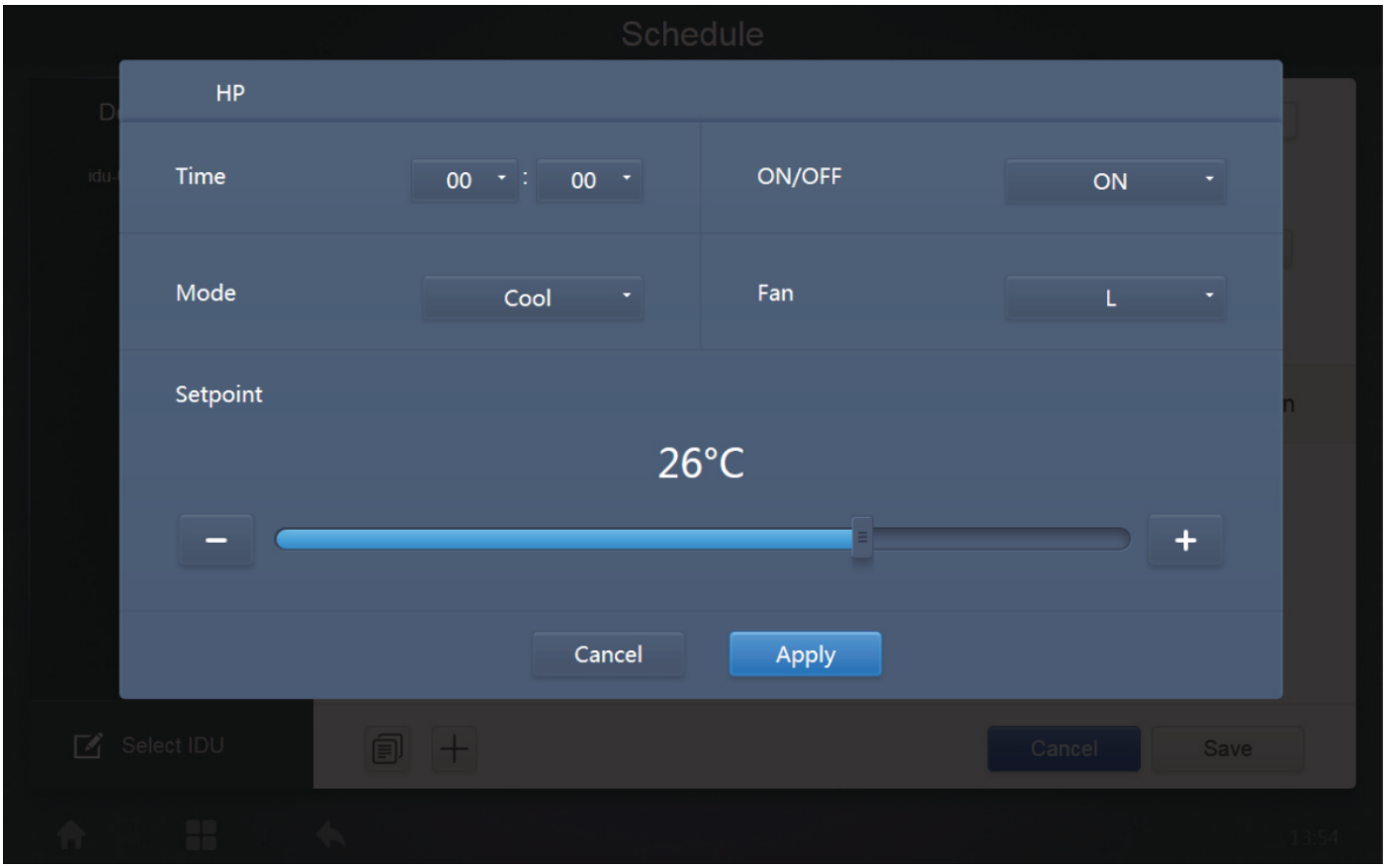
*Note: The schedule will not be implemented during the holidays unless the holiday exception is selected; The schedule in the custom dates outside the holiday is implemented, even if the date falls outside the period of validity (expiration date) or is part of a weekly plan; The schedule for the remaining dates must be within the period of validity (before expiration date), and must satisfy the weekly plan

Add Schedule Command

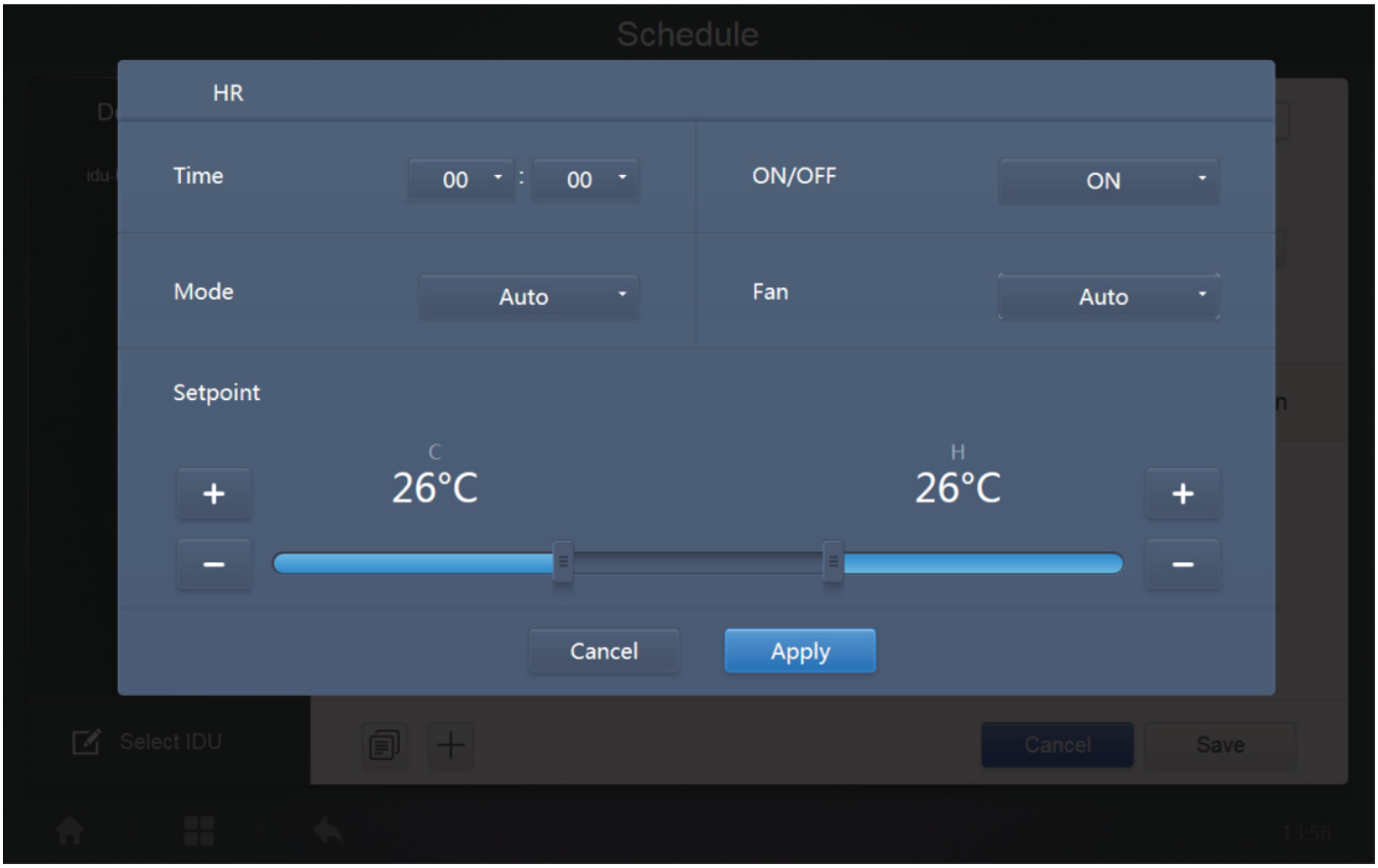


Tap on , to create a table and you will get the dialog box to add the timings. There are four different command types that you can add and these are FAPU, HRV, Auto and No Auto. Once the table is ready, you can use to create a schedule command.

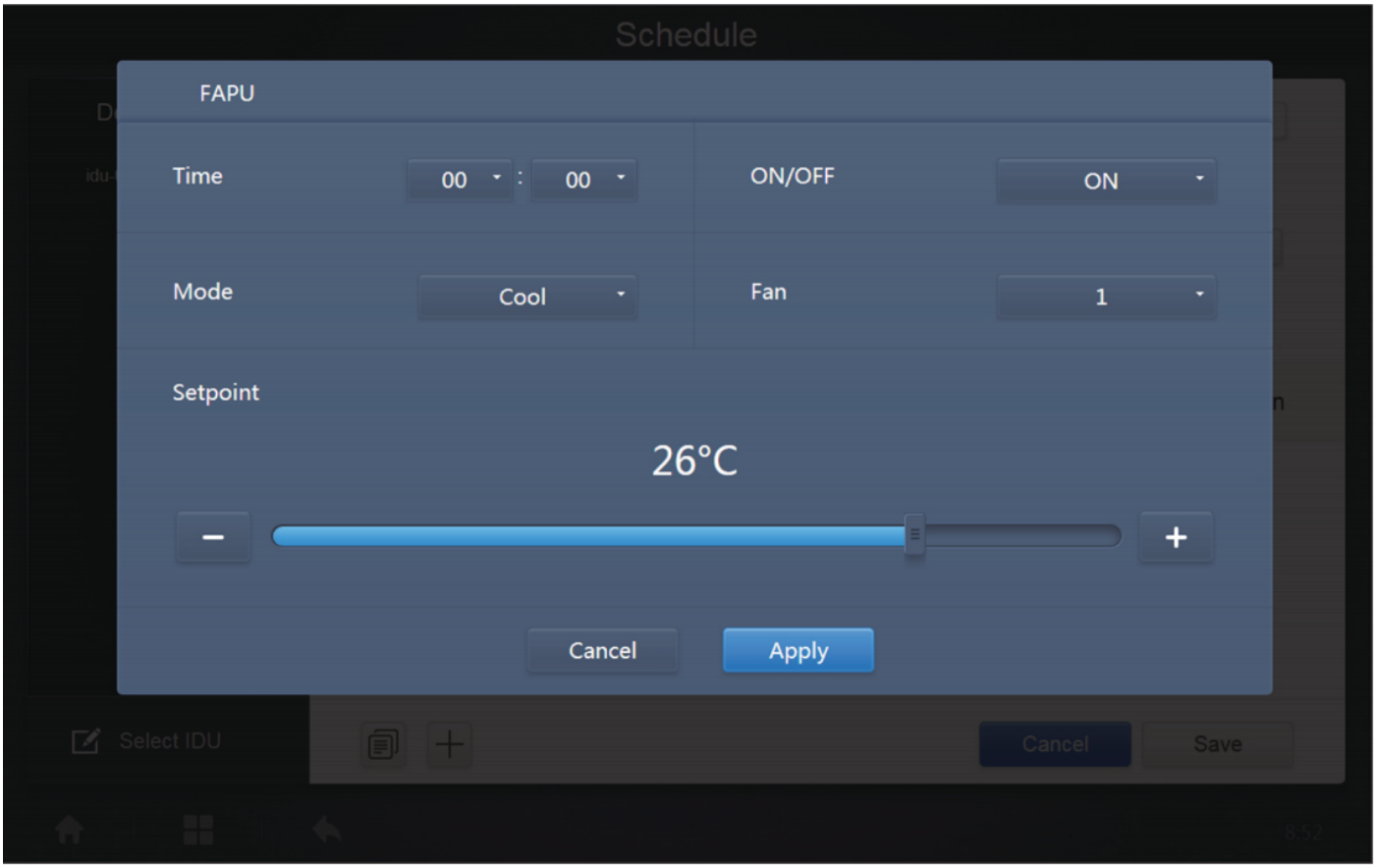
1. For **Heat pump indoor unit:**



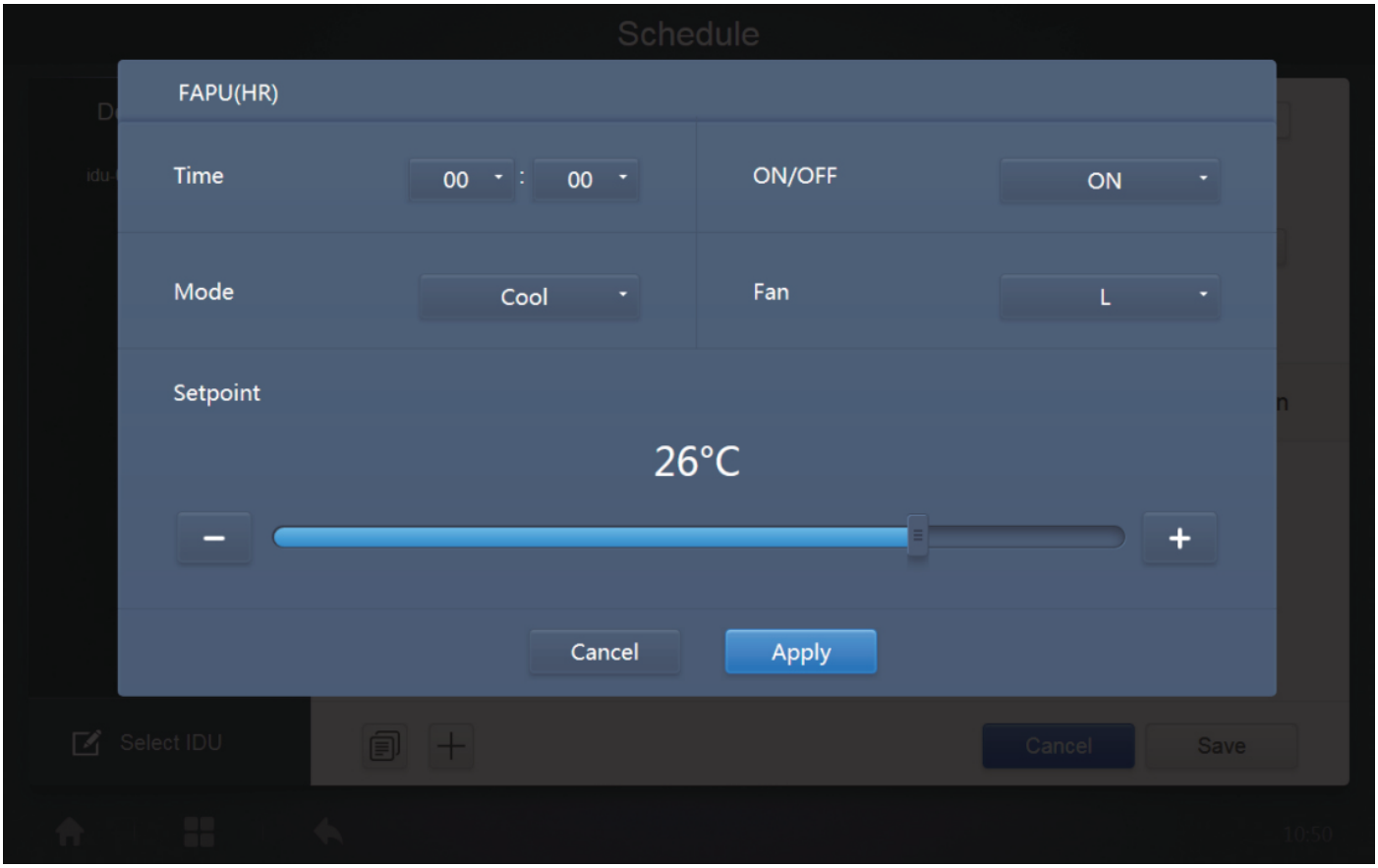
2.For **Heat Recoveryindoorunit:**



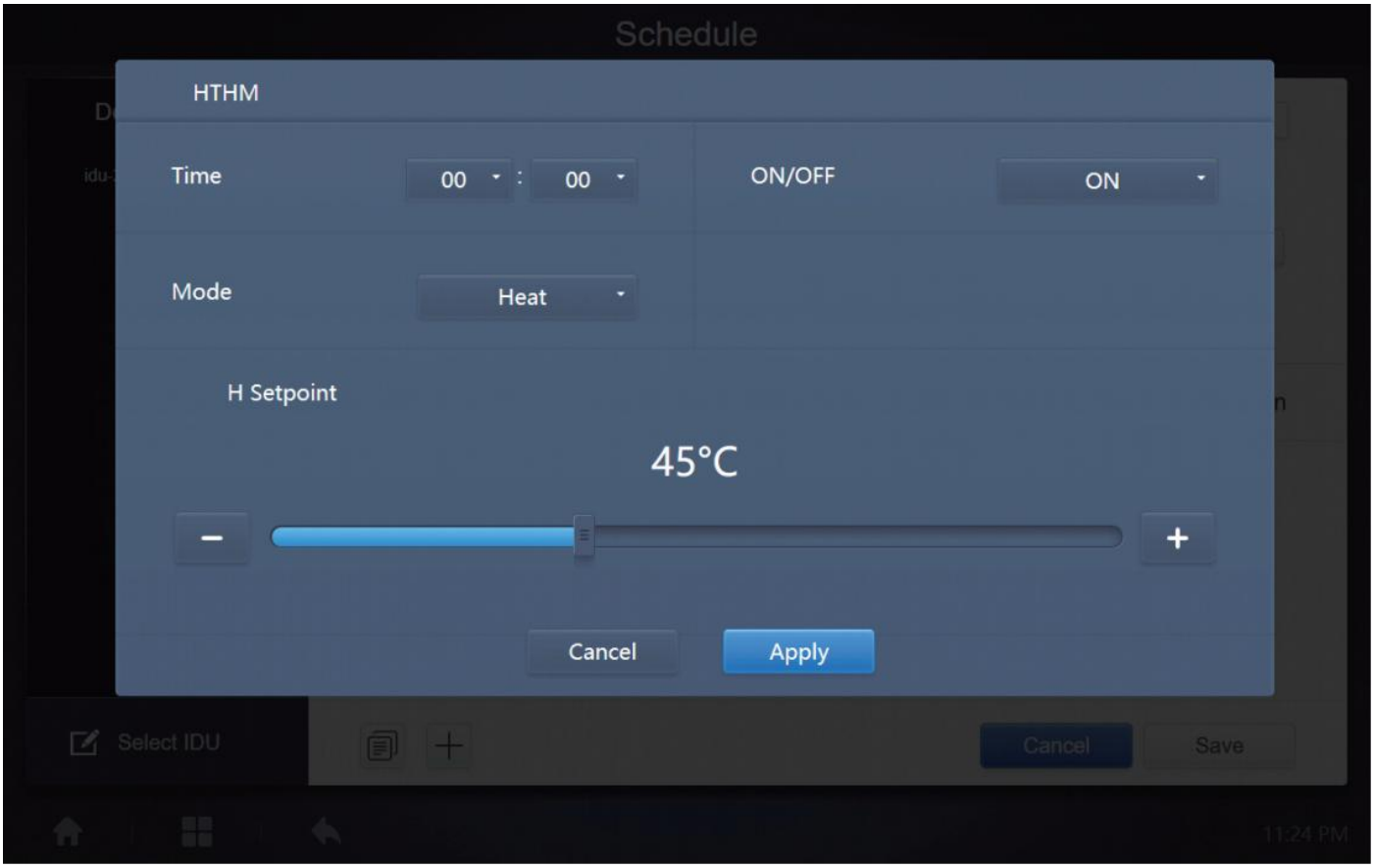
3. For **FAPU:**


Schedule
FAPU
Time
00
:
00
ON/OFF
ON
Mode
Cool
Fan
1
Setpoint
26°C
Cancel
Apply
Select IDU
Cancel
Save

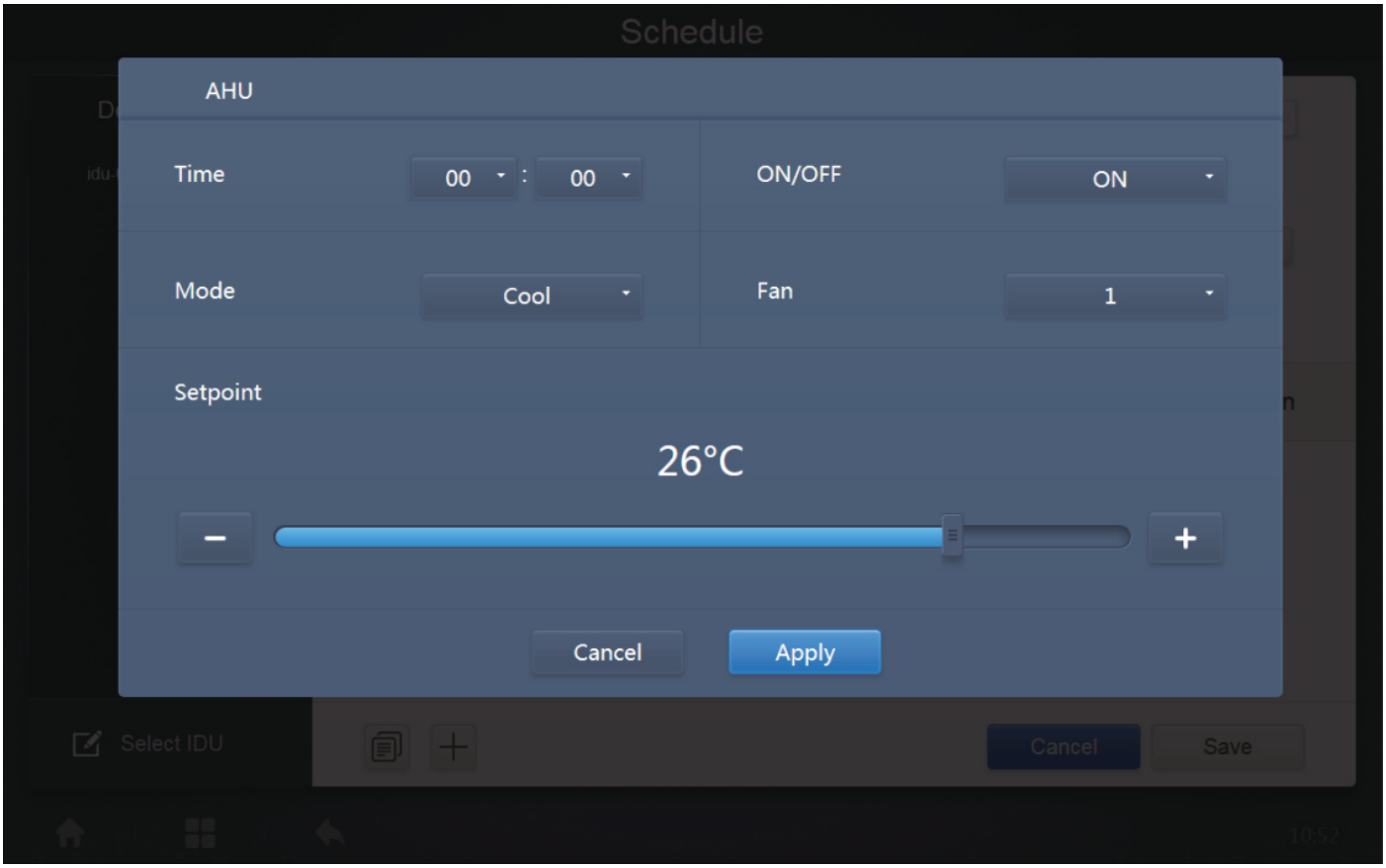
4. For **FAPU(HR):**


Schedule
FAPU(HR)
Time
00
:
00
ON/OFF
ON
Mode
Cool
Fan
L
Setpoint
26°C
Cancel
Apply
Select IDU
Cancel
Save

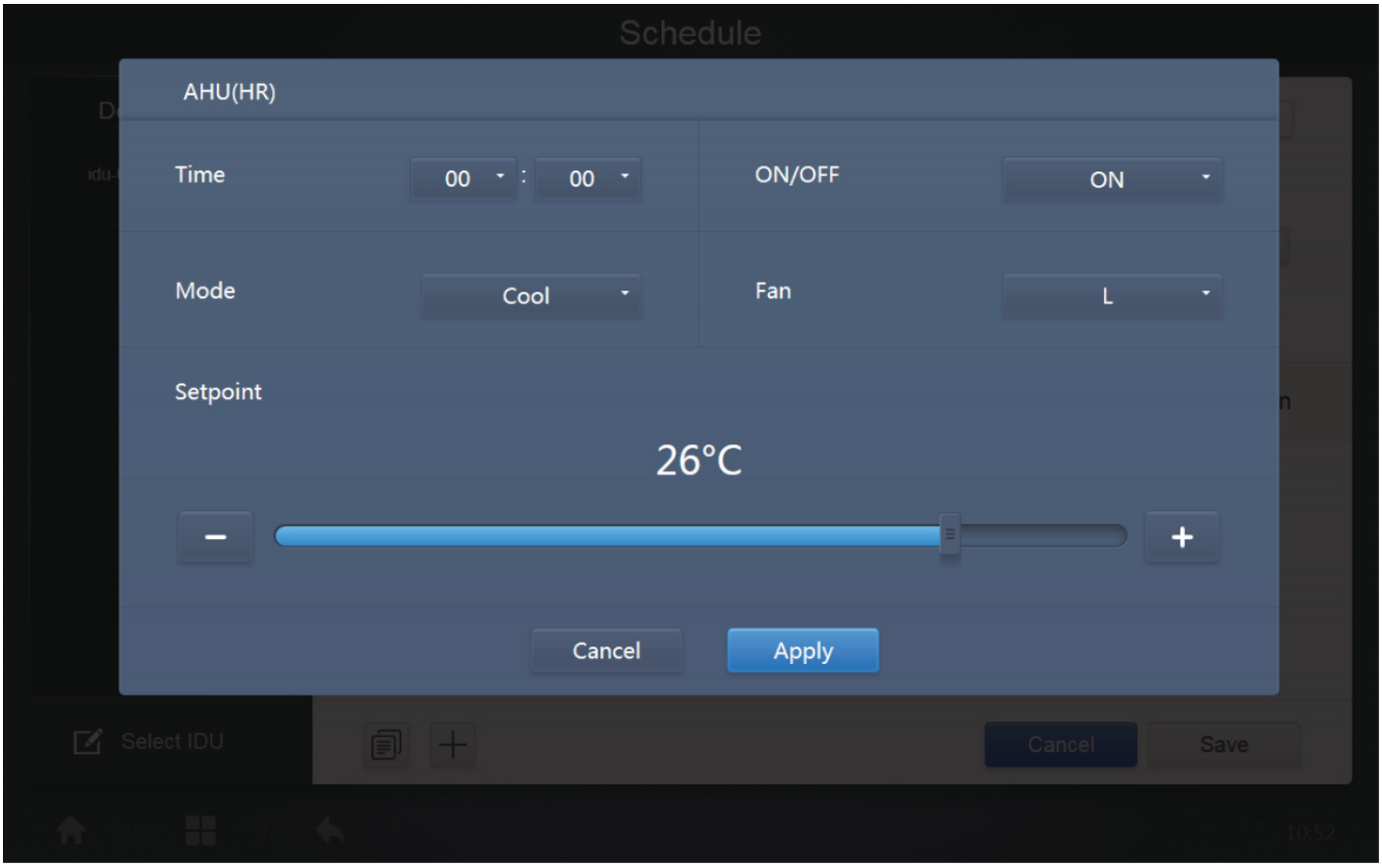
5. For **HTHM:**



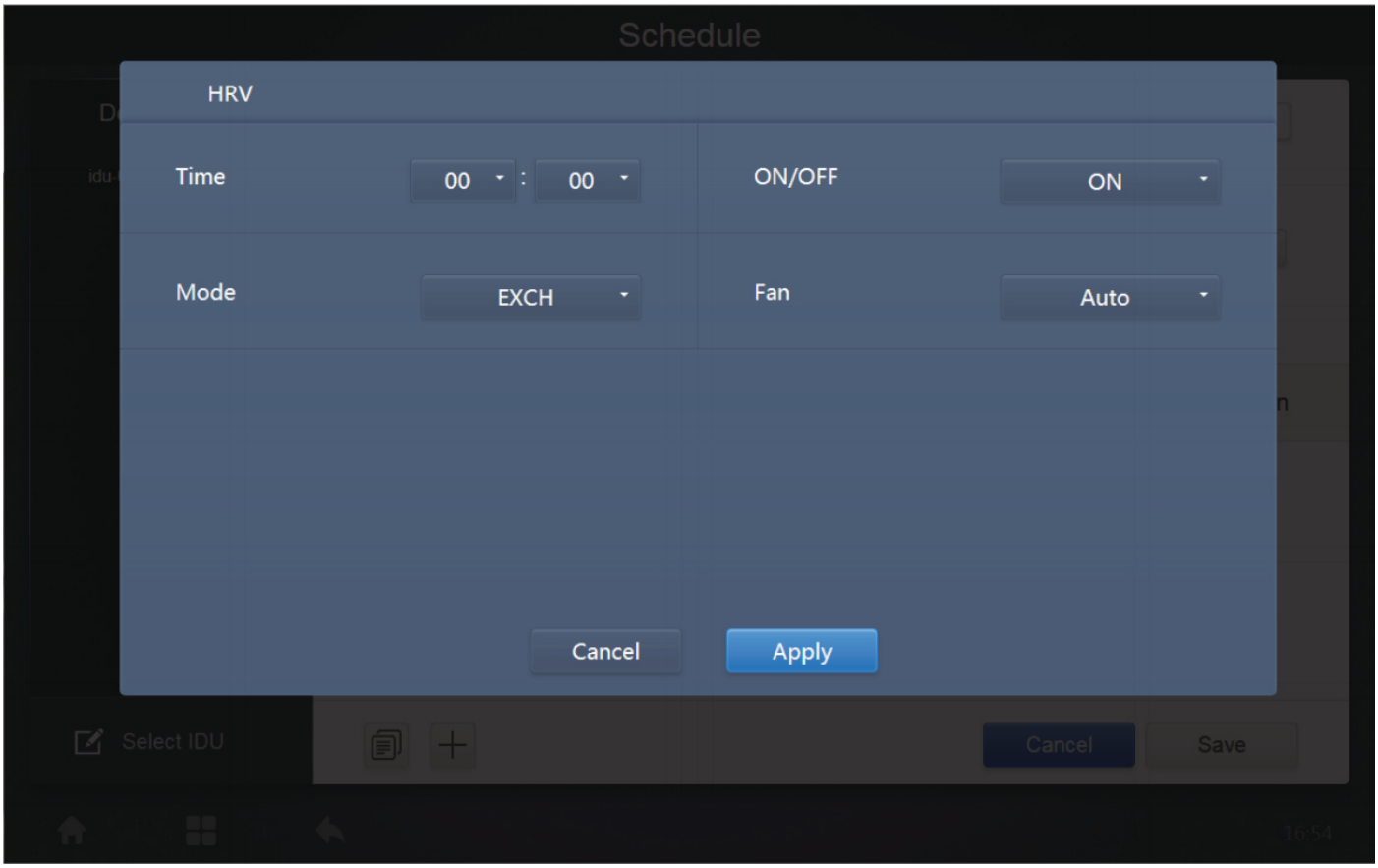
6. For AHU:

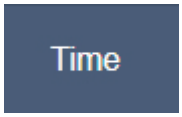
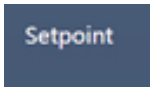
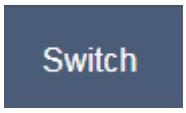
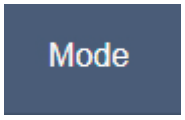
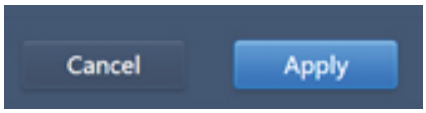


7. For **AHU(HR):**



8. For **HRV:**

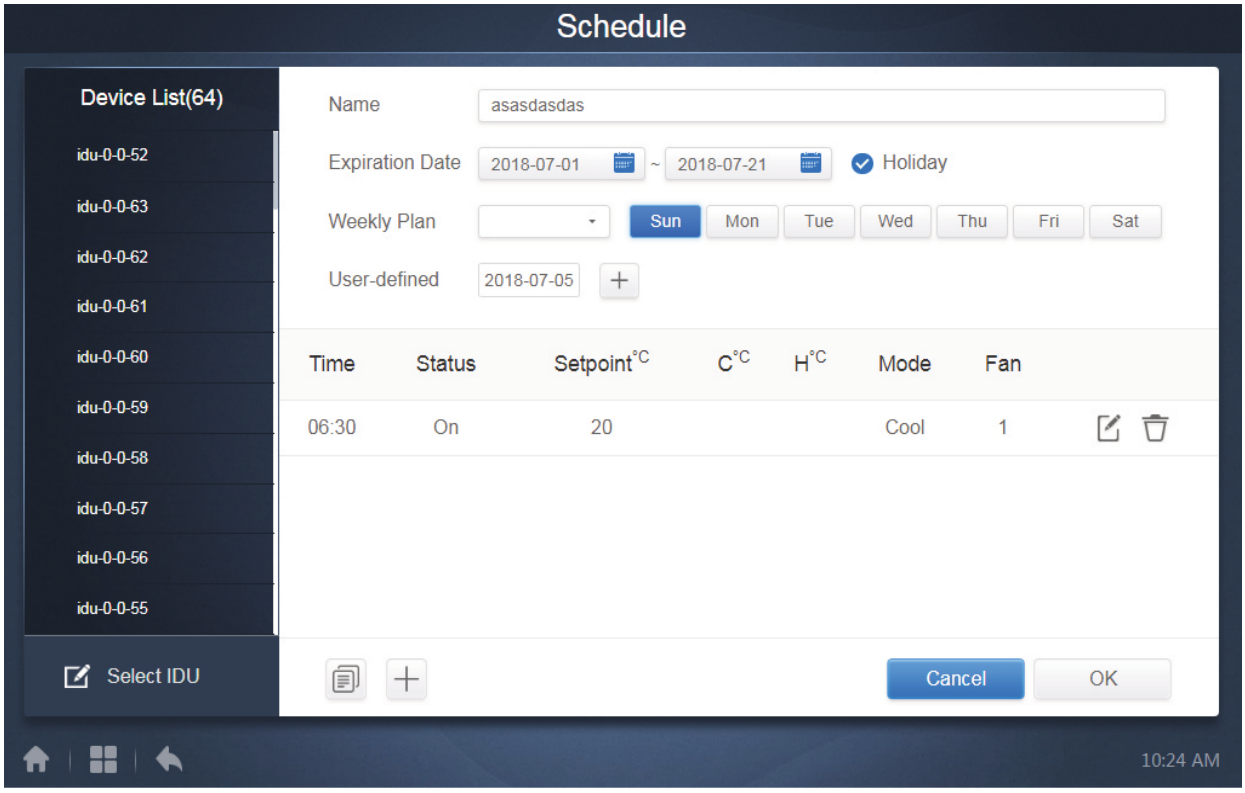


Icon	Description
	It is to set the time for implementation of the corresponding schedule command
	It is to set the Set point Temperatures for the corresponding Indoor Unit, it can be dual set points in case of Auto mode whereas in other case it will be single set point temperature.
	To select whether to Switch On or Off the unit at the respective time.
	This setting is to select the corresponding operation Mode for the respective unit. The operation modes would be different according to the different types of indoor units as has been dexribed in the pictures above
	This option is to select the fan speed
	Clicking Save will save the corresponding edits as a schedule command, clicking Cancel will delete the command

Important points:

1. Tap "+" or "-" on Set point to increase or decrease the temperature by 0.5.
2. Tap "+" or "-" on Time to increase or decrease the time by 1.
3. Tap the left and right arrows to turn on/off the switch. No impact on the mode settings when the Off command is sent.
4. Tap the left and right arrows to toggle the fan speed.
5. If the model in the schedule does not support this command, refer to the response of the actual indoor unit.

Important Points:

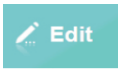


1. Clicking  will copy the latest added schedule command from the list shown in bottom right. Please note that the 23:59 timing command cannot be copied.

2. For the timings that have been saved, tap  to edit again, and  to delete.

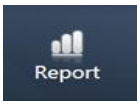
Time	Status	Setpoint°C	C°C	H°C	Mode	Fan	
06:30	On	20			Cool	1	

3. Change Schedule

Tap  on the home page or tap  on the schedule in the calendar view to change the schedule. On the home page, the schedule is marked by  . On the schedule view page, the entry point is the selected schedule.

The operating method for the schedule editor is similar to that for adding a new page. The difference is that the screen will remain on the schedule editor page for "Save".

1.6 Report

On the Home Page, tap 

. to use the Report function. To use this function the software must have been activated before. The details about the Activation of Energy Statistics function are discussed in the “Advance Settings” tab of the “Settings” Menu

There are 3 modules for users to choose from:

1. Operating Duration
2. Running Record
3. Energy Statistics

Tap the corresponding key to enter the module.

(Before Activation)

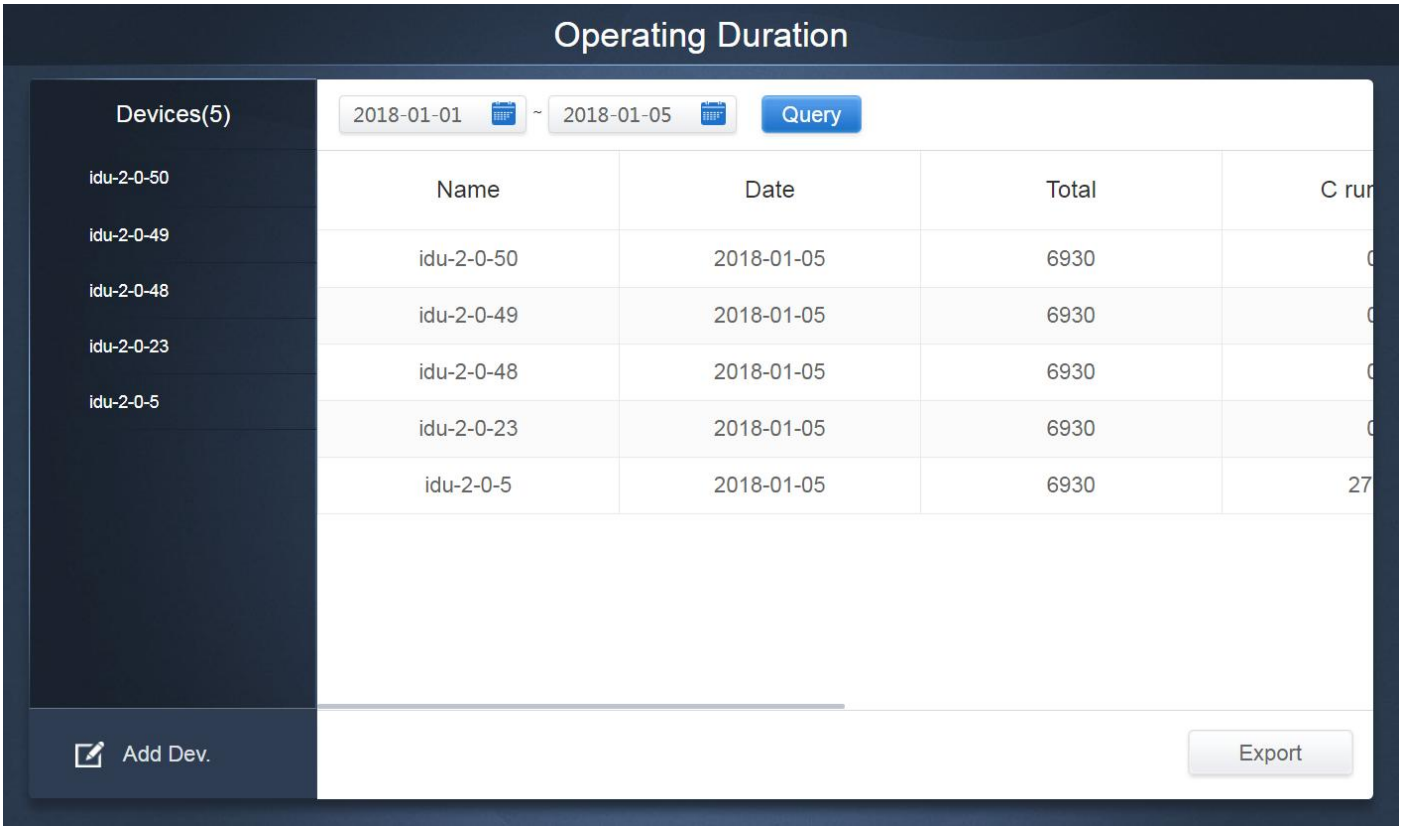
(After Activation)

1.6.1 Operating Duration

Operating duration report: It can be used to view the total operation duration of the IDUs within a specified time period.

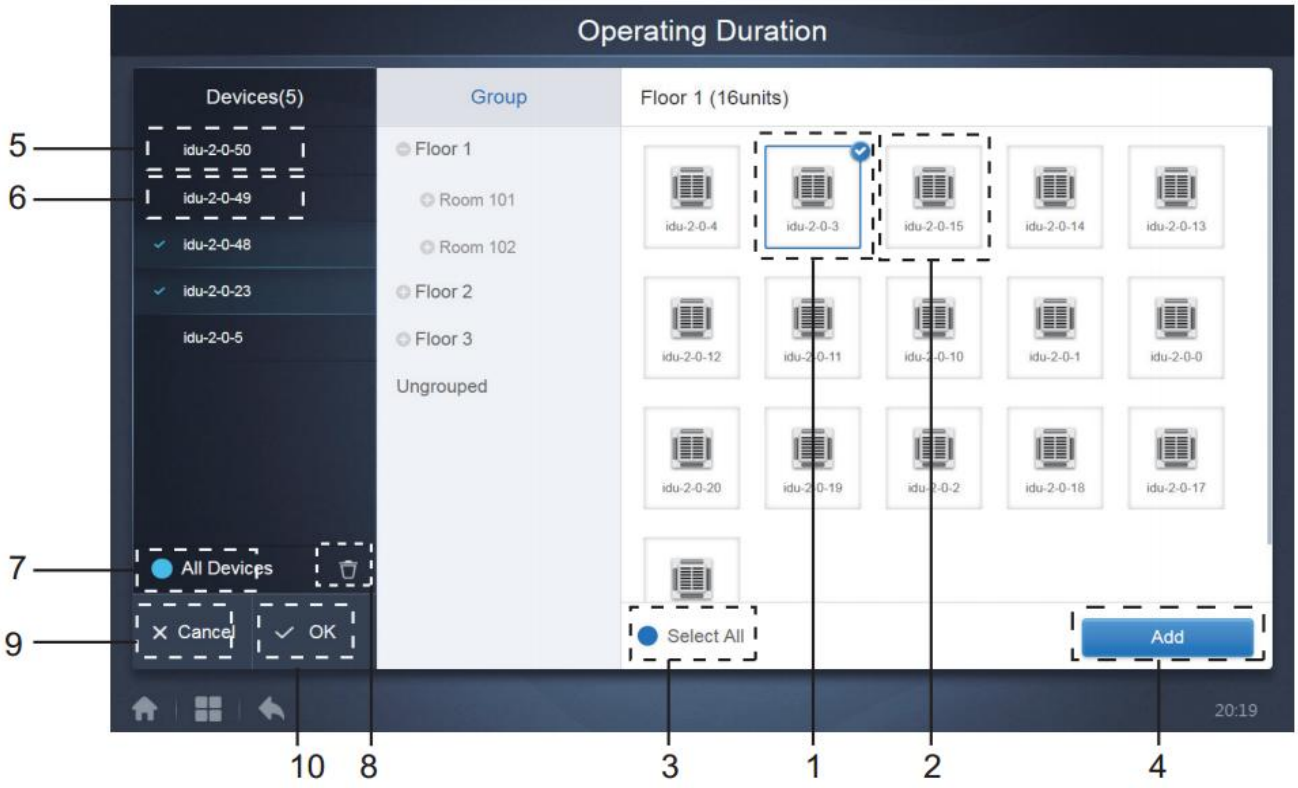
Note: You can query the time and energy statistics reports only after the operating electricityfile has been generated. The electricity file is generated at every point.

Query Duration



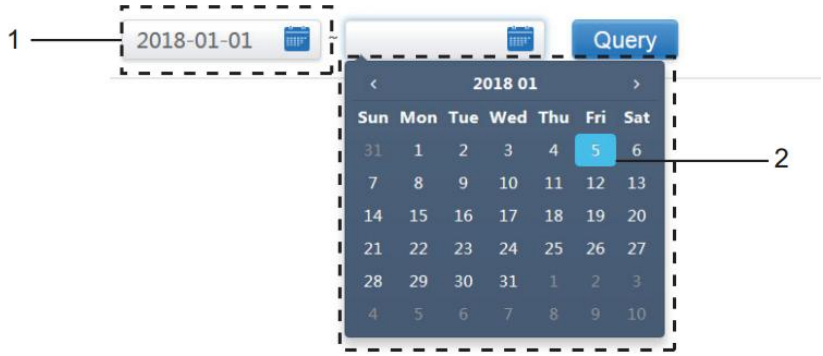
Procedure

1. Tap the selected device to go to the device selections page.
2. Details of the device page are as follows:



No	Function
1	Devices waiting to be selected are displayed in the rightmost area, and these are the devices that have not been added to the selected subgroup. "1" is a selected device and its top right corner is marked with .
2	"2" is a device that has not been selected. Tap the unselected device to select the device. Tap again to deselect the selected device.
3	Tap to activate "Select All". is an active status. After activation, all the devices waiting to be selected in the group are selected. Tap again to deselect all. Manually cancel the selected status of a few devices after "Select All" has been activated. Will not cancel "Select All". Tap again to cancel the "Select All" option
4	Tap to add the selected device
5	Displays the device that has been added. You can tap to select this operation. “5” is a device that has not been selected, tap to select it
6	Displays the device that has been added. You can tap to select this operation. "6" is a selected device, tap to deselect it. Left of the selected device is marked with .
7	Tap to activate "Select All". is an active status. After activation, all the devices waiting to be selected in the group are selected. Tap again to deselect all. Manually cancel the selected status of a few devices after "Select All" has been activated. Will not cancel "Select All". Tap again to cancel the "Select All" option.
8	Move the device that has been selected to be added to the group out of the “Add Device” queue
9	Exit without Saving
10	Save and Exit

3. Perform the time selection, once the device has been added.



No	Function
1	Tap in this area (except the blue calendar icon) to activate the calendar.
2	Tap any number to select the date. Selected date in the box has a light blue background, otherwise today's date is selected. The grey text is a date that is outside this month. Tap to select it. Tap the time at the top to quickly locate the date. Tap once to go to the quick selection function for the month. Tap twice to go to the quick selection function for the year. Use the arrows on both sides at the top to quickly toggle the year and month. Each toggle is a 12-year duration for quick selection of year, 1-year duration for quick selection of month, and 1-month duration for quick selection of date. Tap the left arrow to move to previous month or year, and the right arrow to move to the next month or year

*Refer to the Appendix part 3 of this manual to see the exported Excel files from the Software.

1.6.2 Running Record

The running record also needs to satisfy two conditions before the query is carried out. The operating procedures and query method are similar to Operating Duration. The query results are displayed in a table form. You can query the following data:

Operating duration, IDU name, model, IDU group number, IDU ID, operating mode, temperature set point, set temperature/cool temp_set in auto mode, heat temp set in auto mode, fan speed, IDU ambient temperature, error code, lock cooling set temp., lock heating set temp. mode-lock, wired controller lock, remote controller lock, fan-lock, On/Off lock, swing lock, up/down swing.

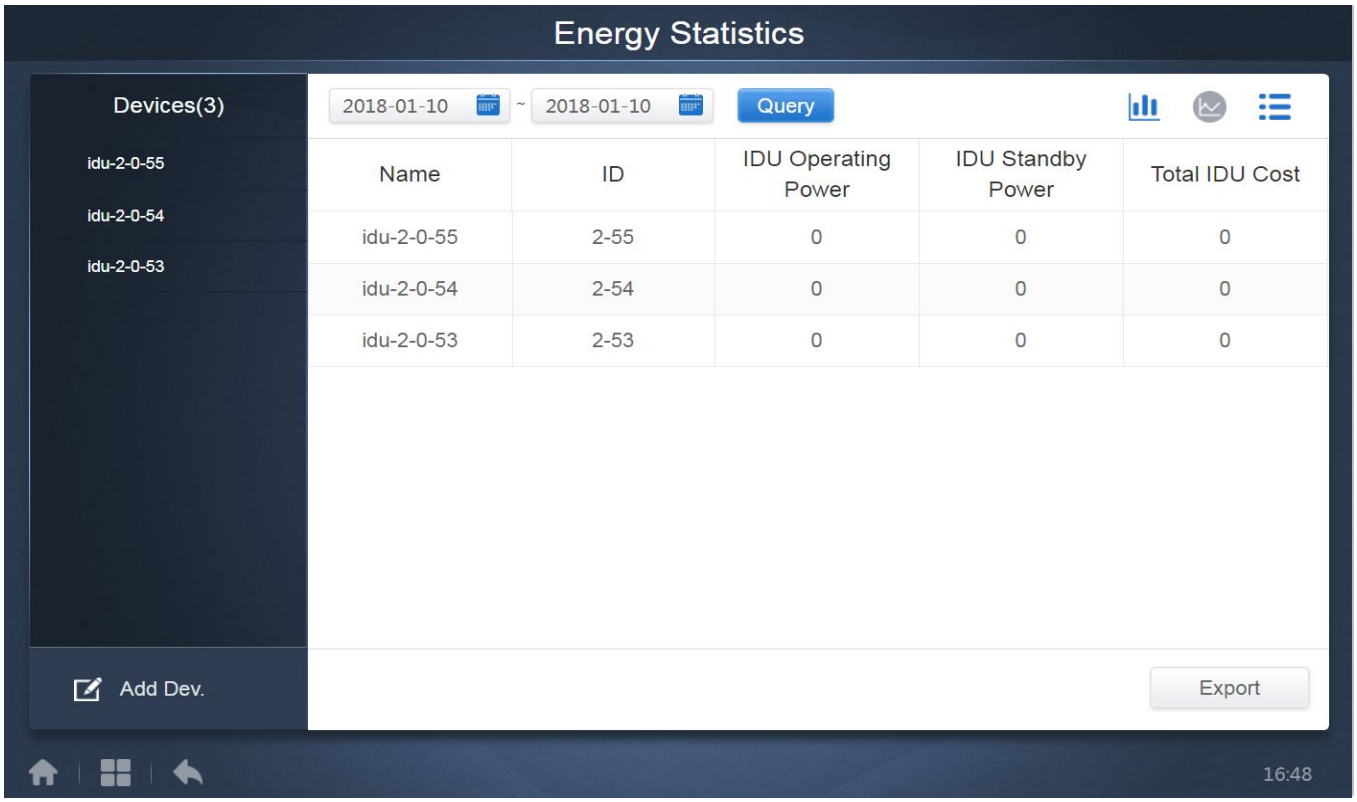
*Note: Historical records can only display and export the most recent 500 records within the specified period.

*Refer to the Appendix 3 of this manual to see the exported Excel files from the Software.

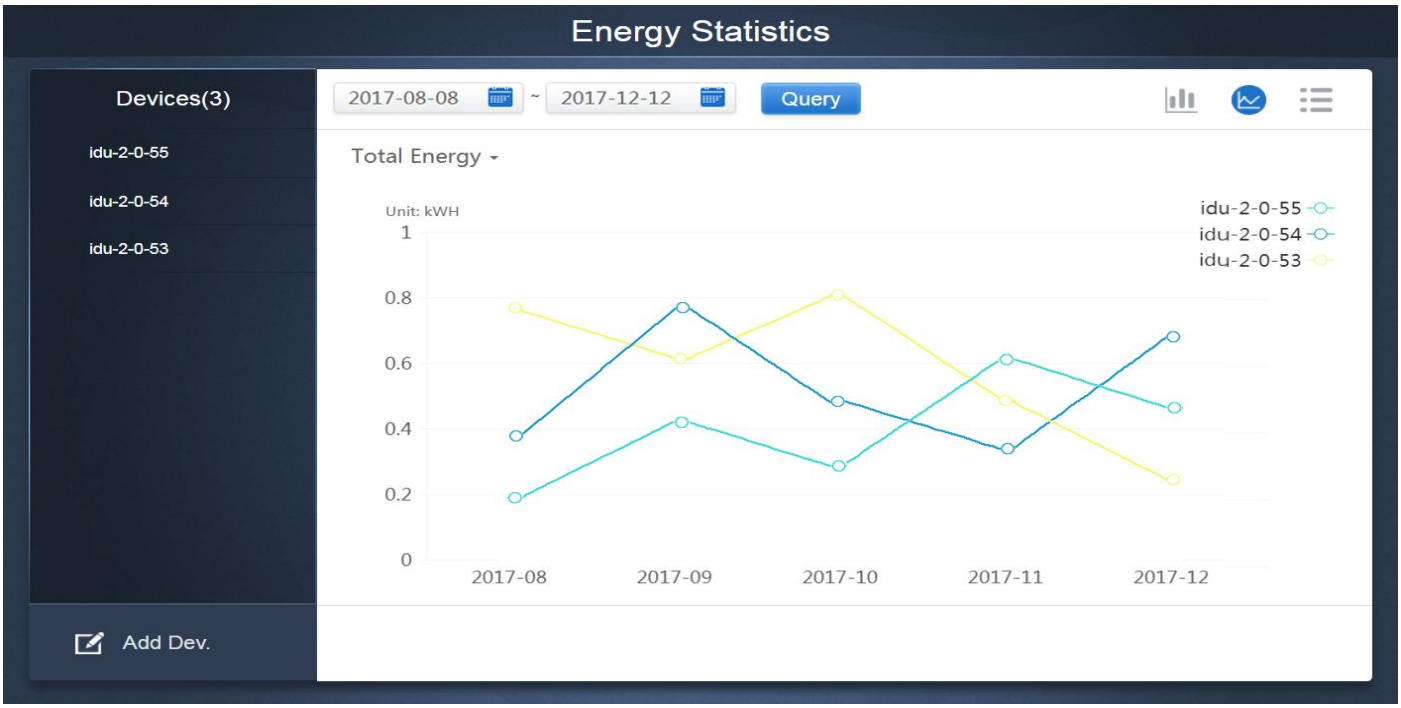
1.6.3 EnergyStatistics

The method to query energy statistics is similar to that for the previous two functions. However, in the coordinate mode, you can only add up to three devices to search. There are no restrictions in the table mode. Use  at the top right corner to select the different modes. The selected mode is blue. The 3 modes are histogram, line graph and table respectively.

ListView



Histogram and Graph



(Line Chart)

(Histogram)

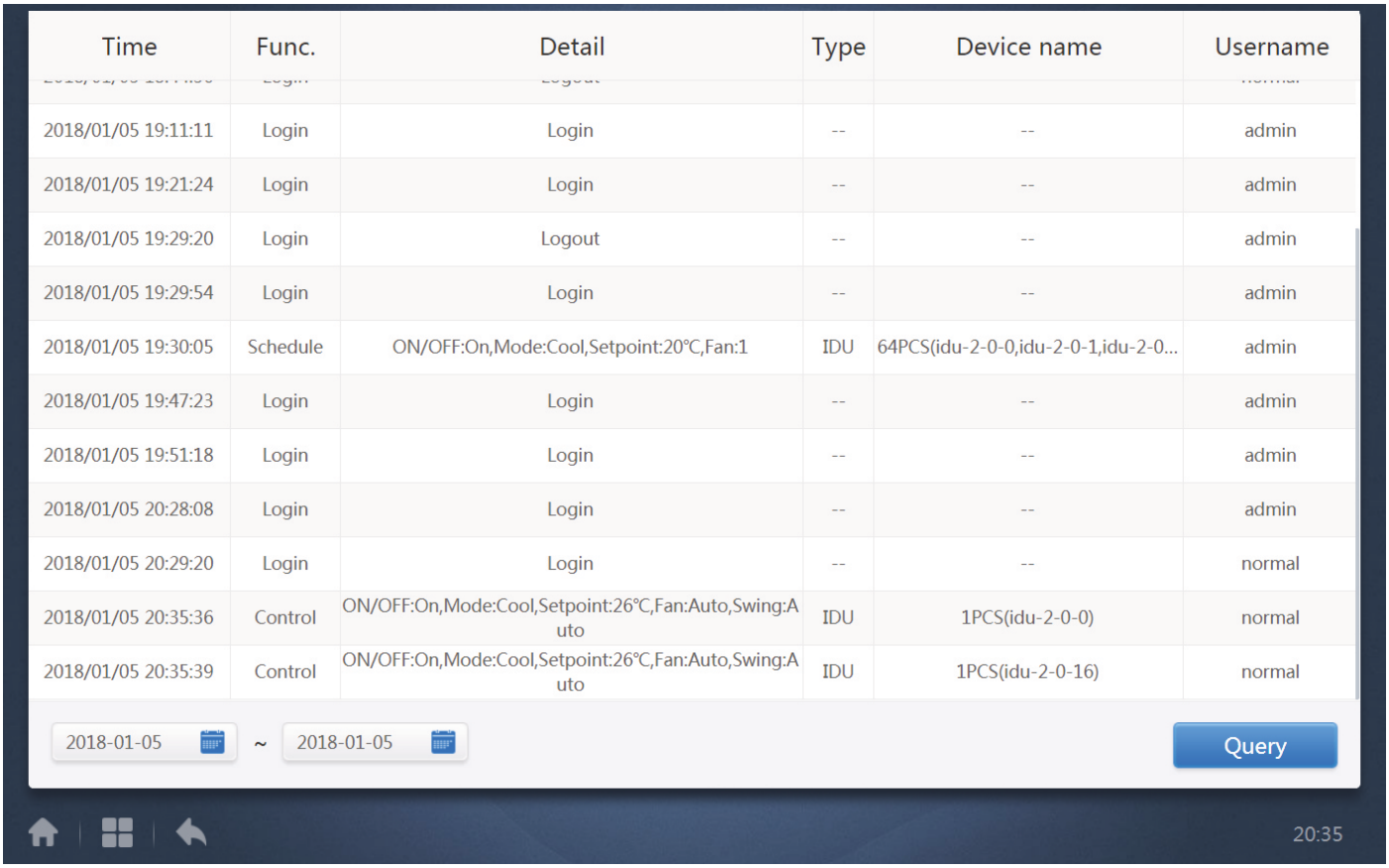
For histograms and graphs, you can only select 3 objects, and select either IDU or refrigerant system. The selected time for graphs and lists is based on the month (effective graph is based on day). There are only two options in total energy: total energy, and operating energy. In the graphs, histograms and tables, the optional parameters are "Total Energy" and "Operating Energy".

Device	Operating energy	Total Energy
IDU	Operating Electricity	Operating Electricity + Standby Power
ODU	Operating Electricity	Operating Electricity + Standby Power + Exceptional Energy

*Refer to the Appendix part 3 of this manual to see the exported Excel files from the Software.

1.6.4 Log

Tap  at the bottom left corner of the Home page to go to the log page



Certain operations of the software are recorded in logs, and these are classified into the following categories:
General control command
ECO control command
Schedule control command
Login and logout
Select the start time and end time at the lower-left corner. Tap "Query" to display the log contents within this statistic compilation period.

Note: When you switch the language, the language used to record the data in the schedule is not refreshed, and the log record is based on the data language at the time of creation.

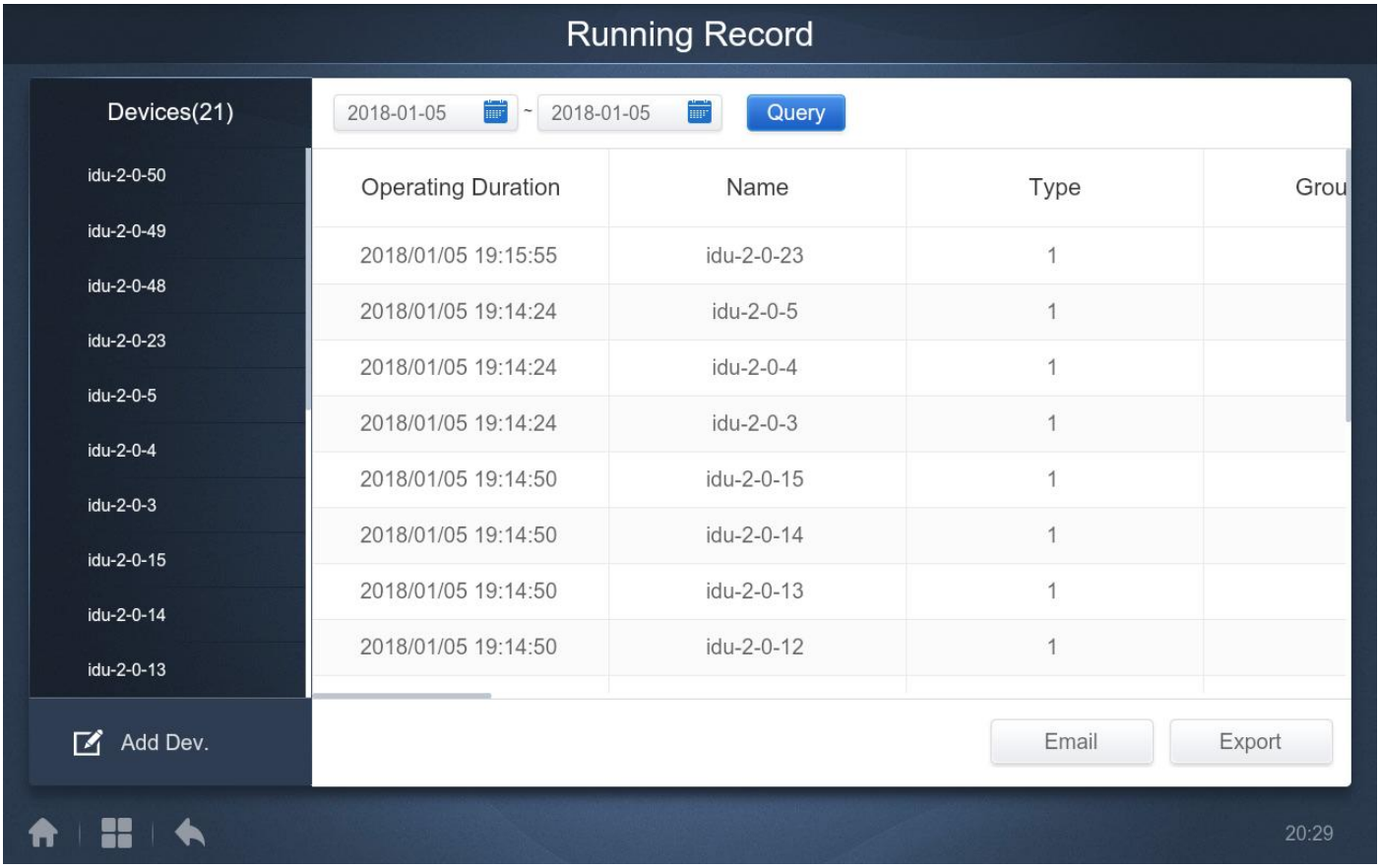
1.6.5 Export Function

For Operating Duration, Running Record, and Energy Statistics reports, there are functions to export the queries records to .csv files (except for histograms and graphs). The contents of the exported files are consistent with the current results of the queries. The format of the file is .csv, and it can be viewed and edited with Excel. Naming convention of the exported file is:

Operating Duration: running_timestamp.csv;

Running Record: record_timestamp.csv;

Energy Statistics: energy_timestamp.csv.

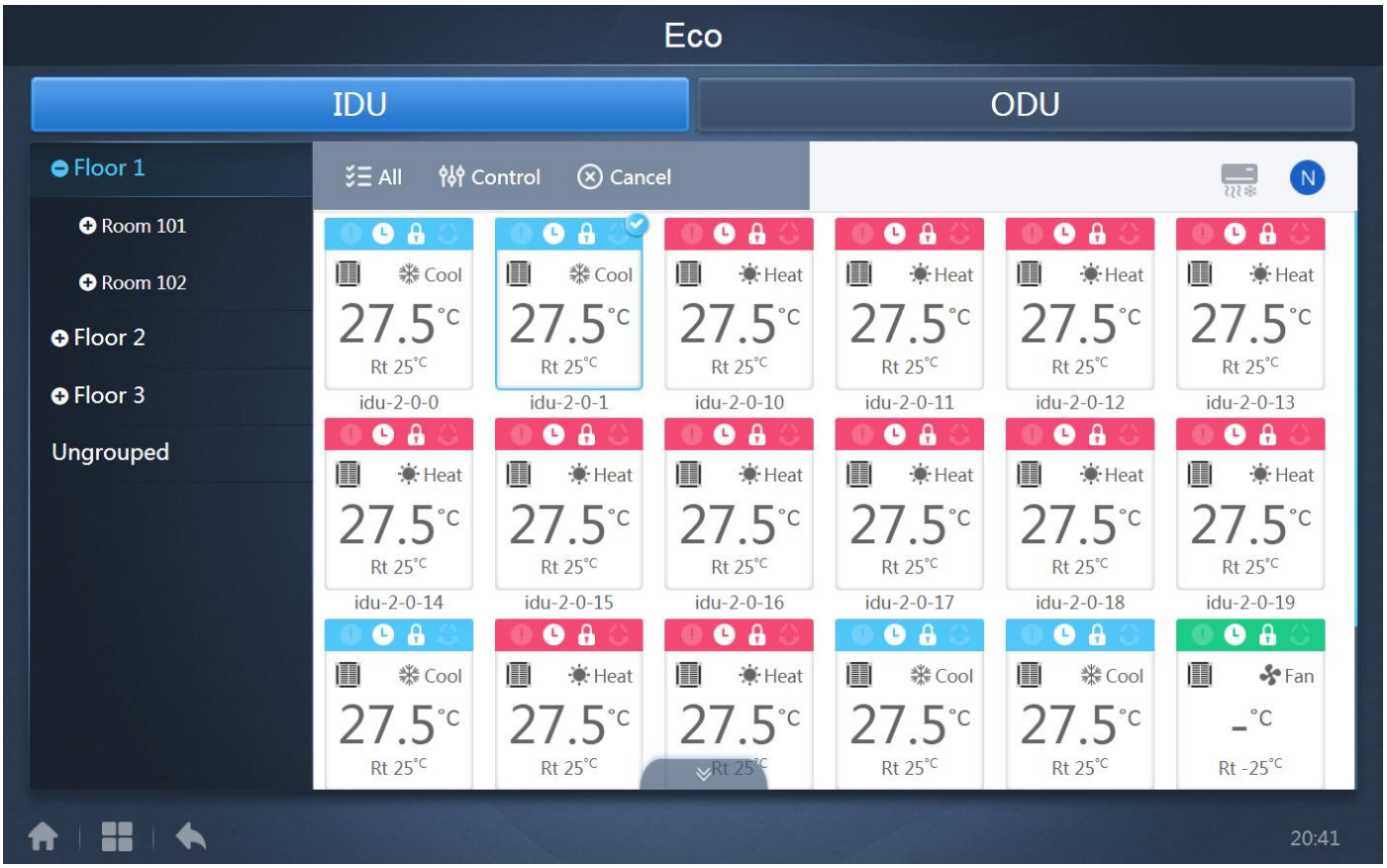


The export target is the default download path for the current browser.

Note- A sample each of the exported documents from Operating Duration, Running Record and Energy Statistics has been shown in The Appendix 3 of this Manual

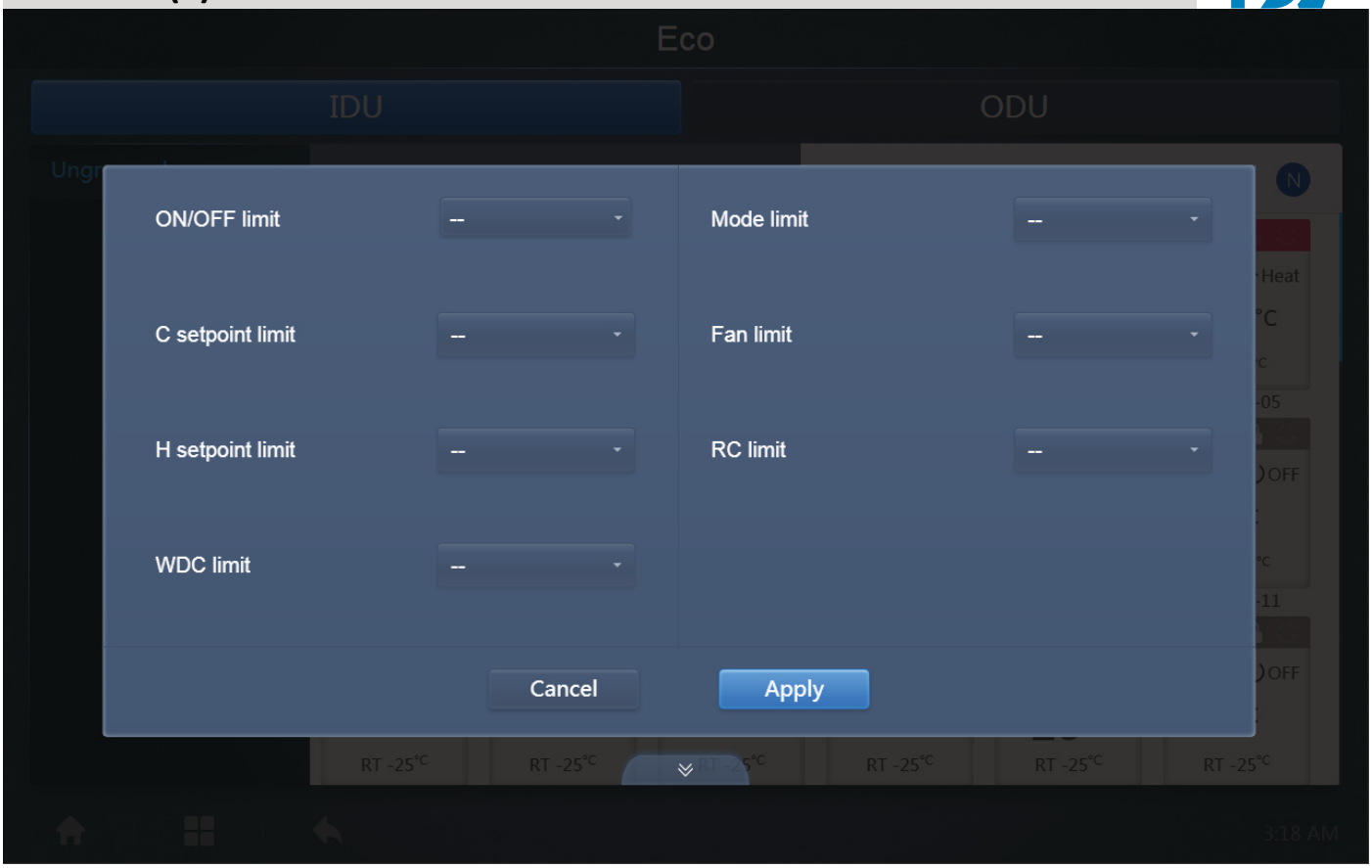
1.7 Eco

This function is basically present to set some limitations on the use of Indoor Unit and Outdoor Units. Using this Tab some of the functions both of the IDU and ODU can be restricted or their range can be limited.



The ECO page is divided into two parts: IDU and ODU.

IDU: The use of all the buttons in “Eco” function is same as in “Control” function. The only difference is that the control commands present here for the Indoor Units are different from the commands present while using ”Control” function.



The description of the control commands is as follows:

Control command	Description
ON/OFF limit	The options available are "--"*, "Unlimited" which means no limitation, "ON" the unit will remain ON , "OFF" the unit will always remain OFF.
C setpoint limit	The options available are "--"*, "Unlimited" which means no limitation, the other options are to set the exact value of Cooling Set Point temperature. The user cannot change the cooling set point temperature below the limitation temperature
H setpoint limit	The options available are "--"*, "Unlimited" which means no limitation, the other options are to set the exact value of Heating Set Point temperature. The user cannot change the Heating set point temperature above the limitation temperature
Mode limit	The options available are "--"*, "Unlimited" which means no limitation and the Modes according to the type of Indoor Unit*
Fan limit	The options available are "--"*, "Unlimited" which means no limitation and the Fan speed from 1 to 7
RC limit	The options available are "--"*, "Unlimited" which means no limitation and "Limited" which means that the remote controller cannot be used.
WDC limit	The options available are "--"*, "Unlimited" which means no limitation and "Limited" which means that the wired controller cannot be used.
Apply Cancel	Clicking on "Apply" will save all the commands changed for the unit. Clicking on "Cancel" will keep the commands as before.

*Note-Certain indoor units may not support one or more locks described above.

All parameters are "--" by default which means that no command is set

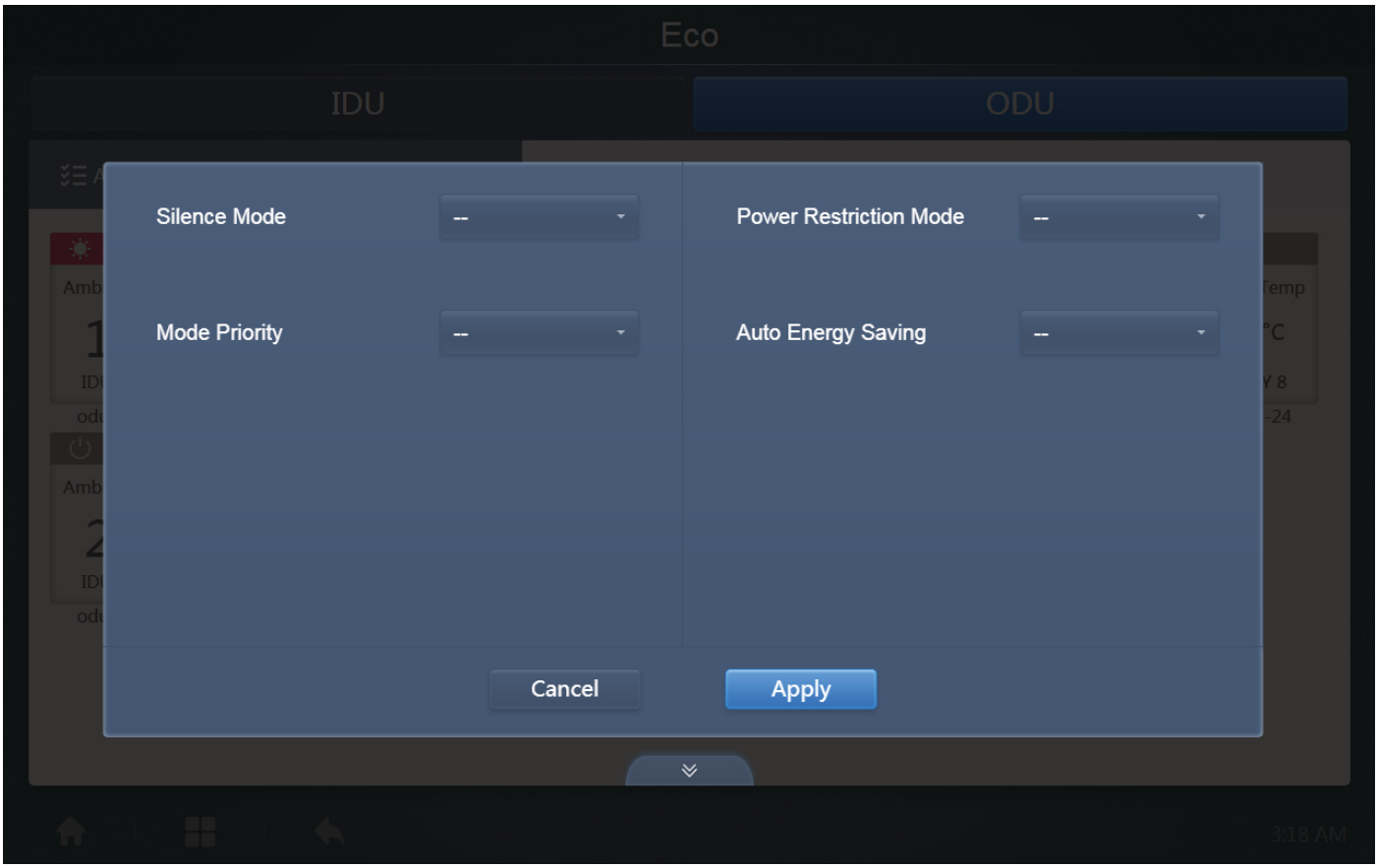
For HRV- Bypass, Discharge, Fan, Auto, Heat Exchange

For Non-Auto Mode IDUs - Cool, Heat, Dry, Fan

For Auto Mode IDUs- Auto, Cool, Heat, Dry, Fan

For Fresh Air Unit – Cool, Heat, Fan

ODU:Outdoor Unit page directly displays ODU objects. The control for outdoor Unit is also similar for all the buttons, after selecting one or more ODUs, click on the “Control” button to set the limitations for that Outdoor Unit. The descriptions of all the available Limitations functions available for the Outdoor Unit have been described in detail in the below tables.



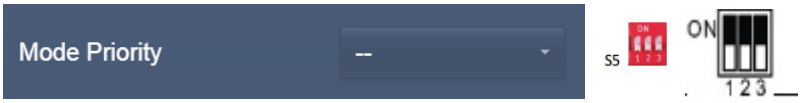
Note-Certain outdoor units may not support one or more lock commands described above. The IMMP-BAC(A) can send any lock command to the outdoor unit. If the outdoor unit does not support the lock command, the outdoor unit will process the command based on its own logic. For details on the different lock functions supported by different outdoor units, refer to the function manual of the corresponding outdoor unit. All parameters are "-" by default which means that no command is sent.

Silence Mode command

The user needs to set the ENC5 switch to F value in order to use tthis setting from the IMMP-BAC(A) device

Setting	Description	IMMP-BAC(A) Option
Silence Mode	Night silent time is 6h/10h (default)	8
	Night silent time is 6h/12h	9
	Night silent time is 8h/10h	10
	Night silent time is 8h/12h	11
	No silent mode	0
	Silent mode 1 (only limit max. fan speed)	1
	Silent mode 2 (only limit max. fan speed)	2
	Silent mode 3 (only limit max. fan speed)	3
	Super silent mode 1 (limit max. fan speed and compressor frequency)	4
	Super silent mode 2 (limit max. fan speed and compressor frequency)	5
	Super silent mode 3 (limit max. fan speed and compressor frequency)	6
	Super silent mode 4 (limit max. fan speed and compressor frequency)	7

Mode Priority Command



The user needs to set the S5 switch, all three in ON position as shown below, in order to use this setting from the IMMP-BAC(A) device

Setting	Description	IMMP-BAC(A) Option
Mode Priority	Auto priority (default)	Auto Priority
	Cooling priority	Cool Priority
	VIP priority or voting priority	VIP
	Heating only	Heat Only
	Cooling only	Cool Only

Power Restriction Mode

Note- No Special settings are required to be done on the Outdoor Unit Side, in order to be able to use the Power restriction Mode from IMMP-BAC(A) website.

Setting	Description	IMMP-BAC(A) Option
Power Restriction Mode	Power Restriction mode 1(Only available for the master unit, 100% capacity output)	0
	Power Restriction mode 2(Only available for the master unit, 90% capacity output)	1
	Power Restriction mode 3(Only available for the master unit, 80% capacity output)	2
	Power Restriction mode 4(Only available for the master unit, 70% capacity output)	3
	Power Restriction mode 5(Only available for the master unit, 60% capacity output)	4
	Power Restriction mode 6(Only available for the master unit, 50% capacity output)	5
	Power Restriction mode 7(Only available for the master unit, 40% capacity output)	6

Auto Energy Saving

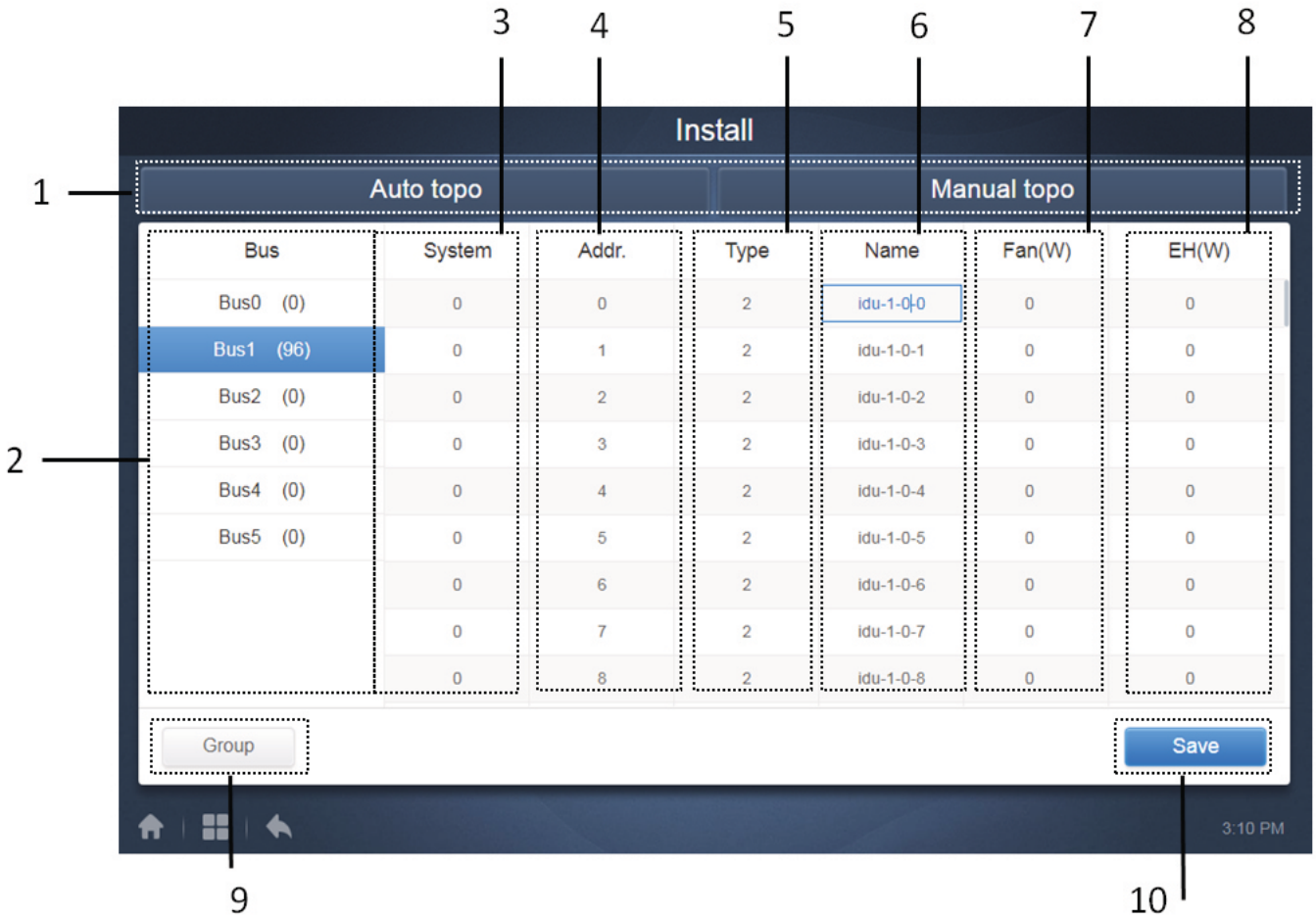
Note- No Special settings are required to be done on the Outdoor Unit Side, in order to be able to use the Power restriction Mode from IMMP-BAC(A) website

Setting	Description	IMMP-BAC(A) Option
Auto Energy Saving	Exit Auto Power Saving Mode	Disable
	Enter Auto Power Saving Mode	Enable

This setting is to Activate or Deactivate the smart Energy Saving Mode for MDV VRF

1.8 Install

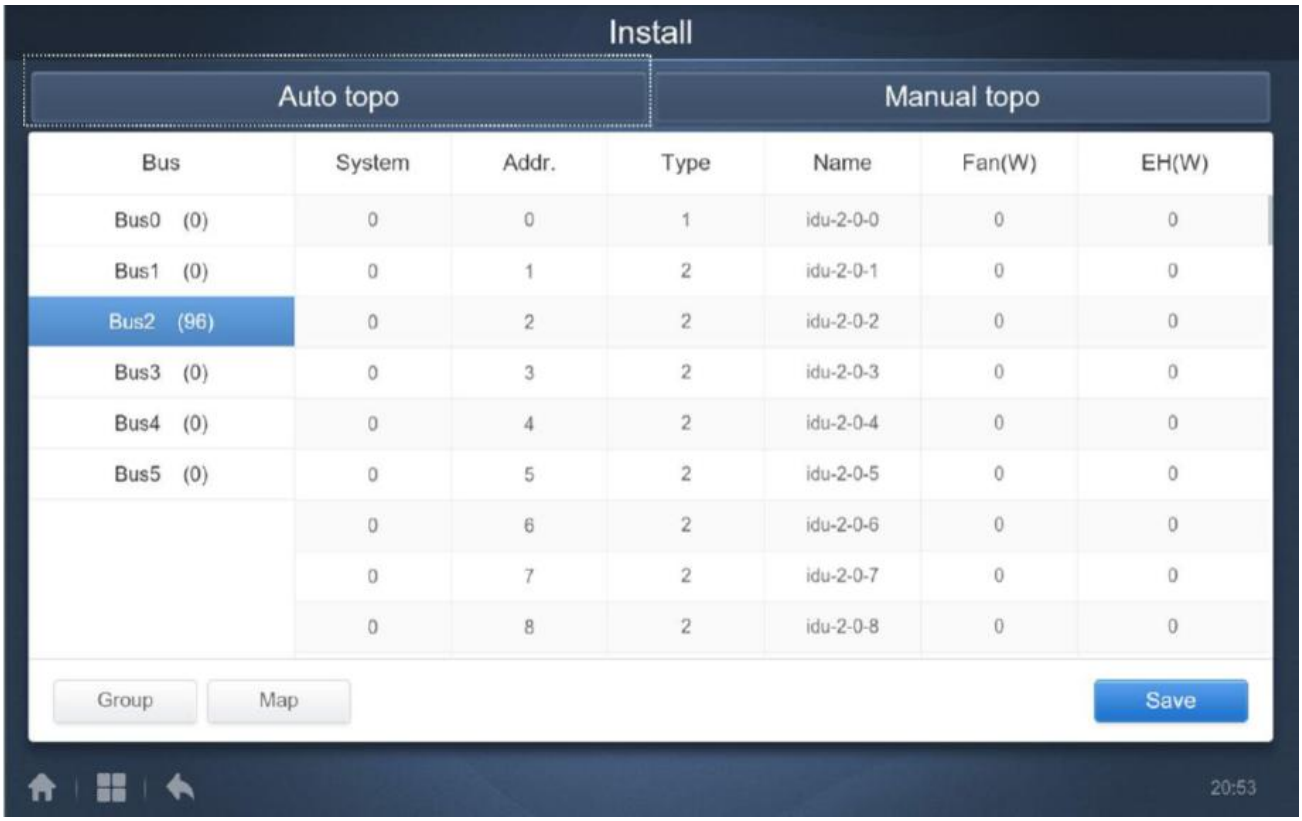
Under this function, we can install the units into the IMMP-BAC(A). There are two options available for installing the units that is the Auto Topo and Manual Topo. It has been discussed already in the Installation and Commissioning part of this manual.

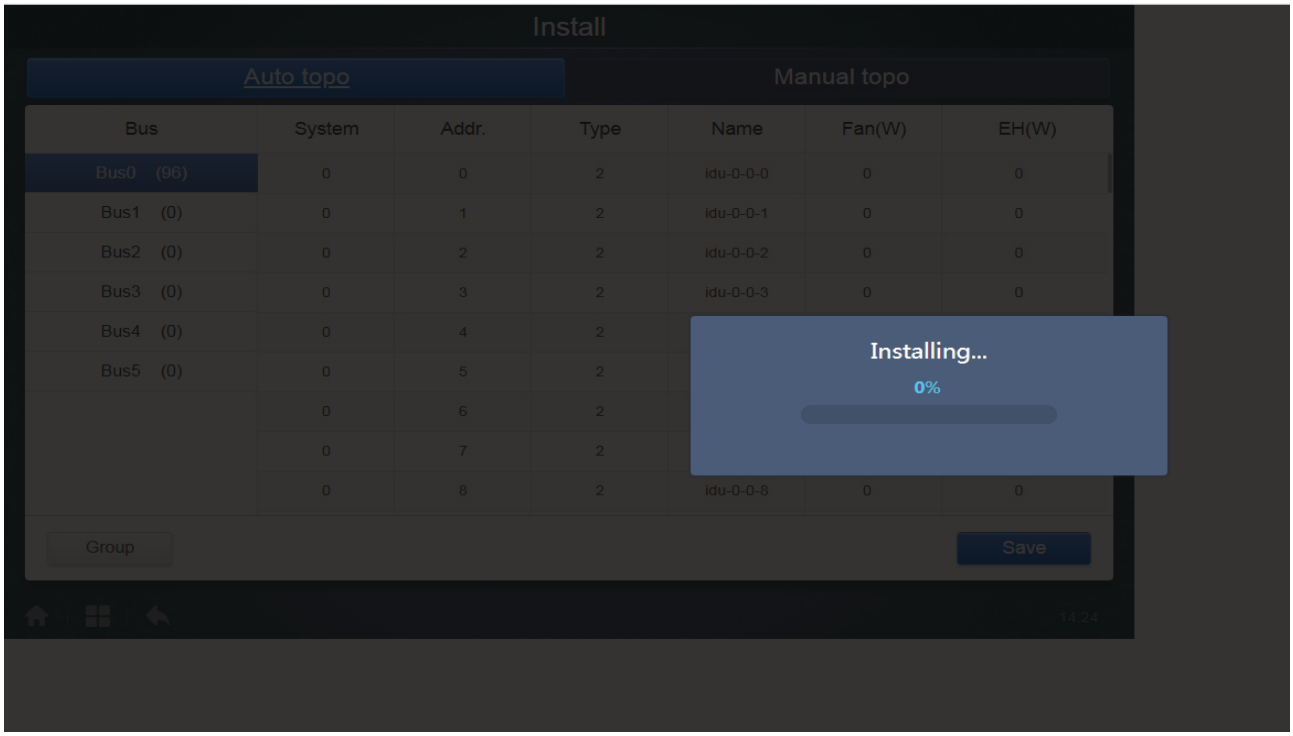


No	Description
1	To select whether to install the units with Auto Topology or Manual Topology
2	This refers to the port number of the IMMP-BAC(A). The corresponding unit's information is shown in the right side of the display. Also attached in the bracket is the number of Units(Indoor AND Outdoor Unit both) are present in that p[articular XYE port of the IMMP-BAC(A).
3	This displays the system number for respective unit
4	This displays the Address of the unit
5	This displays the code of the outdoor/indoor unit. The details about the code of the unit have been given in the " Control" part of this manual
6	It displays the name for the respective Indoor/outdoor Unit
7	This displays the Power rating of the unit. The user needs to put this value by himself for the respective unit by referring the Technical/Service manual of that unit
8	This displays the Power rating of the EH of the unit. The user needs to put this value by himself for the respective unit by referring the Technical/Service manual of that unit
9	This is to manage and create the groups
10	Clicking on this will save all the settings that have been edited

Auto Topo:

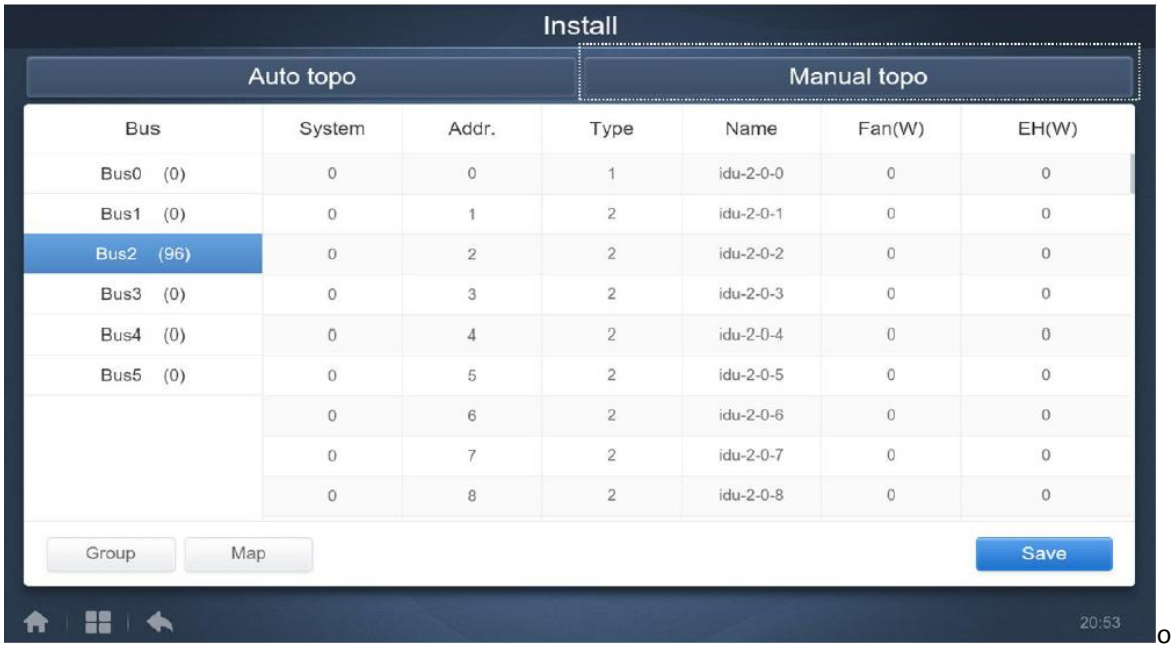
Under this topology mode, the user does not require doing any special settings for the units, just need to connect the units normally and do the IP settings as has been discussed in the Installation Part of this manual. After clicking on the Auto Topo tab, the gateway will begin to identify the units that are connected with the system.

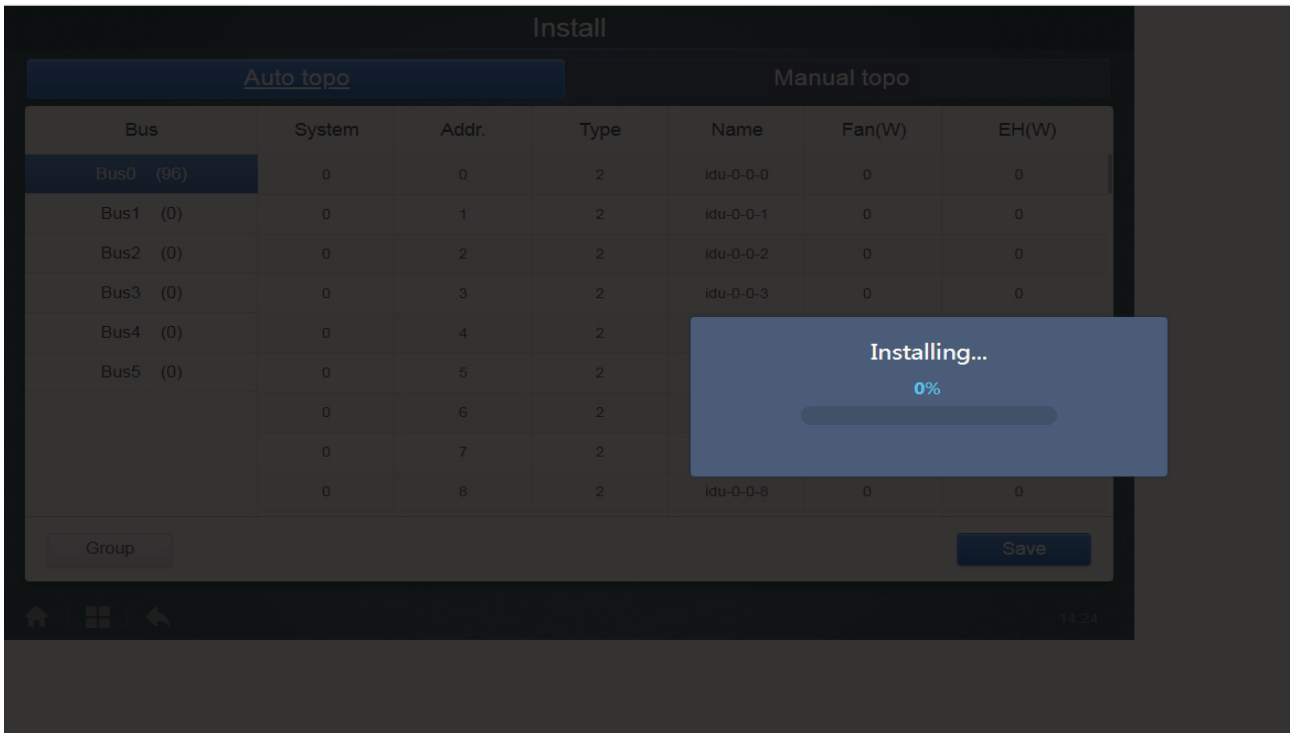




Manual Topology:

In case of Manual Topology, the user needs to insert a Manual topology file giving details about the system to the central controller. The details on how to write the Topology file have been discussed in detail in the Installation Part of this Manual.



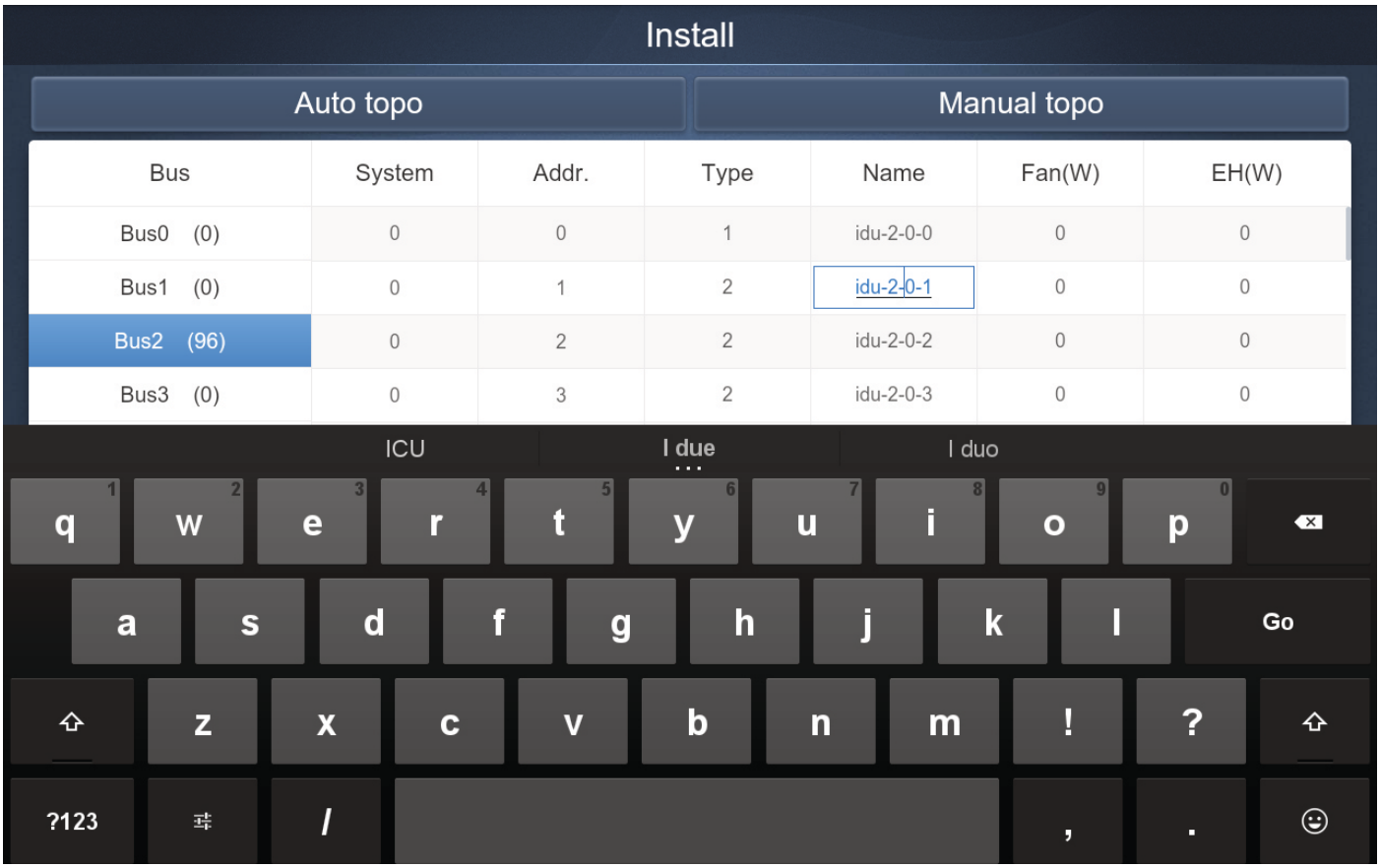


Once the installing has been finished both in the case of Auto Topo or Manual topo, the user needs to click on the “Save” button on the bottom right to store the installation results 

1.8.1 Edit

Clicking on the column for “Name”, “Fan” and “EH” allows the user to edit their values. The name of the unit can be changed for easy identification by the user.

The option for Fan and EH are to set the rated value of power consumed by the Fan or Electric heater of that particular indoor unit. The exact values of these data are present in the respective Technical Manual or Service Manual of that particular unit, the user can refer to that to fill these values. These values would be useful for calculating the Energy consumption by the Air Conditioning System which is available in the “ECS” tab for “Advanced Setting” Menu

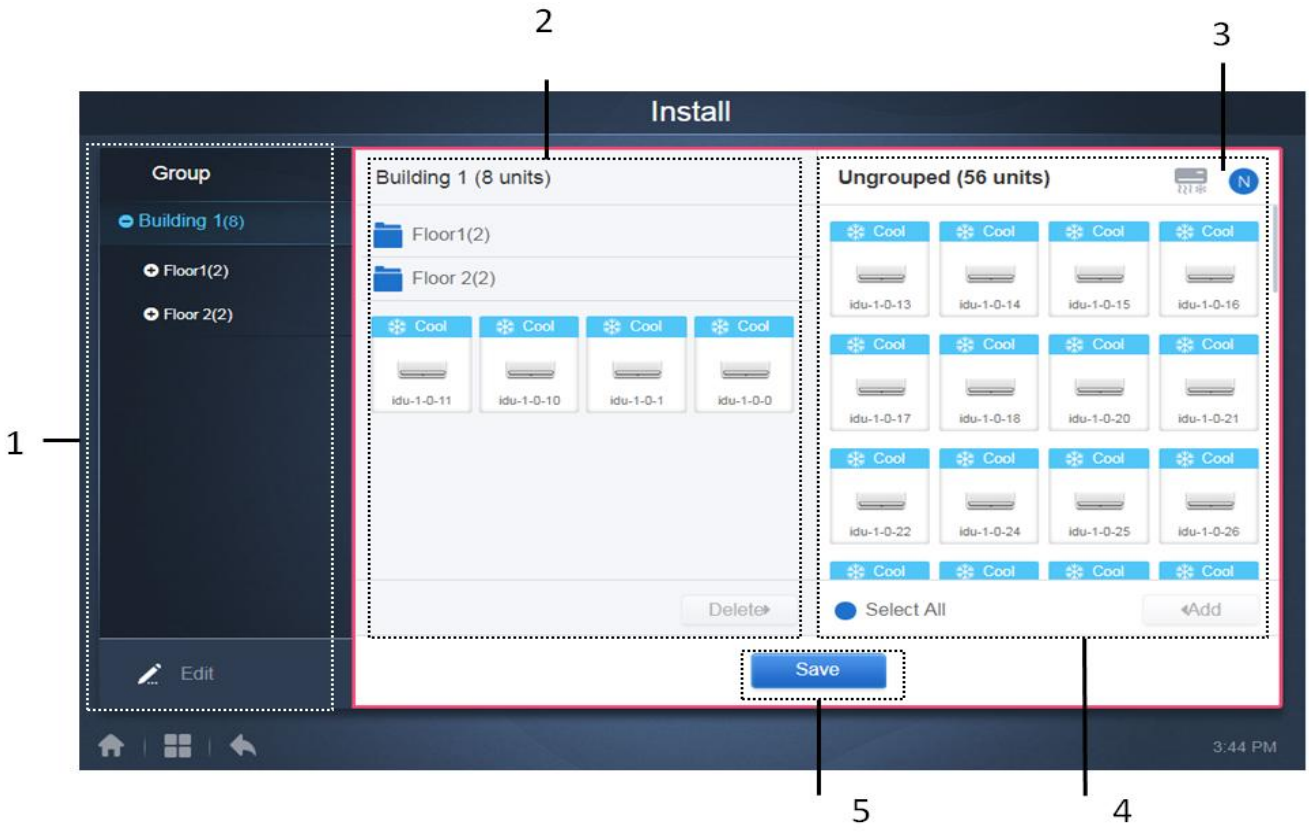


Note:

The acceptable range for the model is an integer from 0 to 12, and the model corresponds to the unit number in the Control. The maximum values of the fan power and the auxiliary heating power (EH) must not exceed 65535, and must not be negative values. The device name length cannot exceed 12 characters. Otherwise, you will receive a prompt that the name is ineligible. The device name cannot be duplicated.

1.8.2 Group

Tap Group at the lower-left corner to go to the group editor from the installation page.

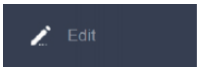


No	Description
1	It shows the groups already created by the user ; clicking on “+” will show the subgroups present under that group , similarly clicking on “-” will hide the groups present in that particular group. Clicking on the name of the group will show the Indoor units present in that group in 2. the bracket besides the name of the group shows the number of units present in that particular group
2	This shows the subgroups present under a group and also the units that do not belong to any subgroup but belong to the group selected. The bracket along the name of each subgroup tells the name of units under that subgroup. Click on a unit to select it and click on Delete to delete that particular indoor unit from that group.
3	Provides the option to sort the Indoor Units by name or by mode
4	This complete part shows the indoor units that do not belong to any of the groups. .Click on the unit to select it and click on Add to add that unit to the current indoor unit group
5	This displays the code of the outdoor/indoor unit. The details about the code of the unit have been given in the “ Control” part of this manual

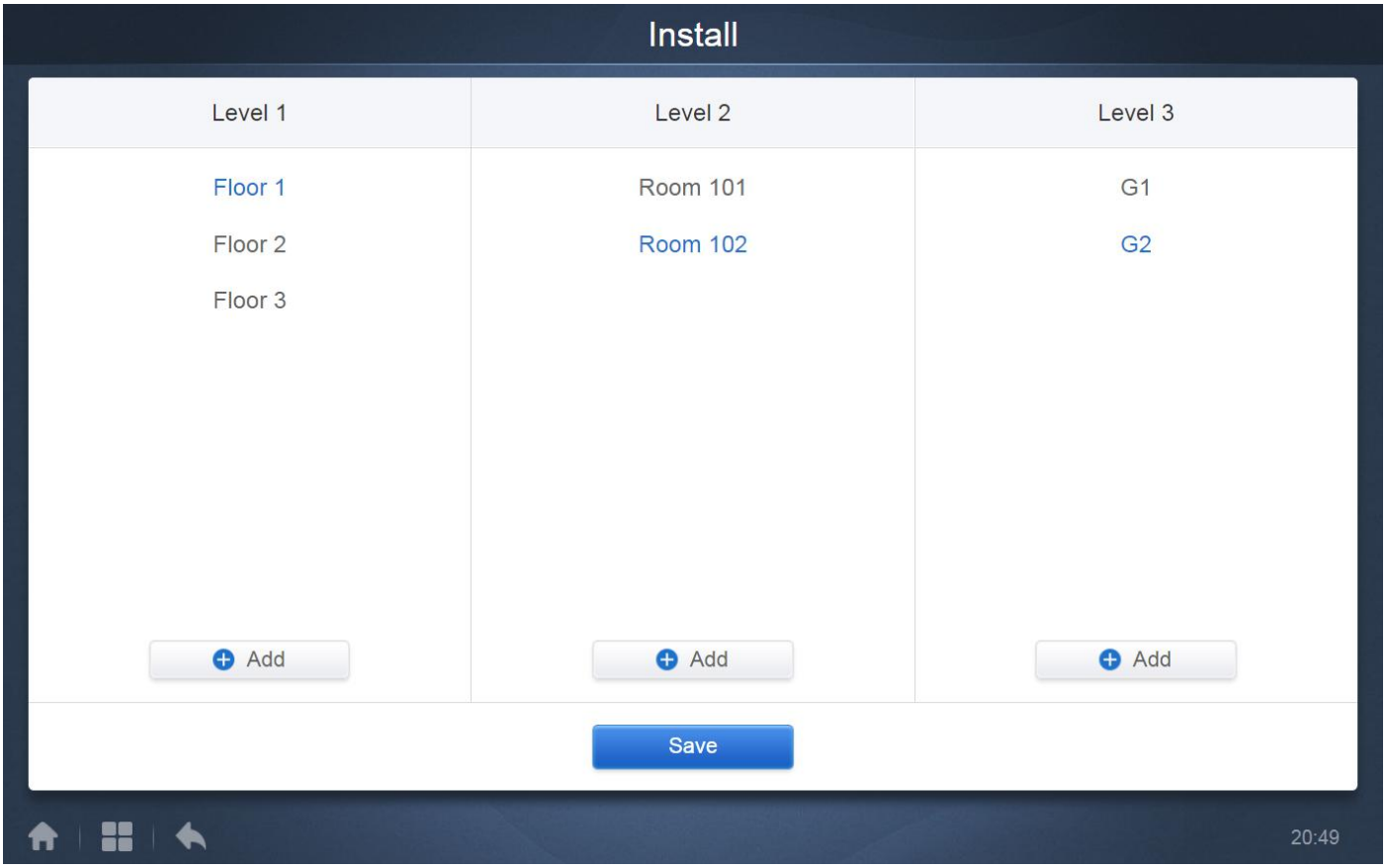
Group Creation is on the Left.

When a group is selected, the group and the indoor units in that group are shown in the middle. Indoor units that have not been grouped are shown on the left

Create, Edit and Delete Group

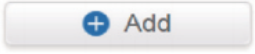
Tap 

at the bottom left corner to go to the pages to create , edit and delete group. The IMMP-BAC(A) supports three group levels. The three levels of the groups have been created with the notion that suppose there is a building, it will be a Level 1 group , each floor of building then becomes the level 2 group and each room on the floor then would be the Level 3 group.. The user can also set the groups according to his own understanding and convenience.



Tap the back key at the lower-left corner to return to the group page.

Create Group

Tap 

, and you will get a textbox for you to edit the group at the corresponding level and the mouse is active.

Enter the name. Tap the CR ("Go") key on the keyboard, or tap in the blank space to exit the editor. Groups at the same level cannot have the same names. Maximum group name can be of 12 characters. You will receive a prompt during "Save" if the name exceeds 12 characters.

Edit, Delete Group

When a group is selected, you will see the edit and delete function keys for the selected group.

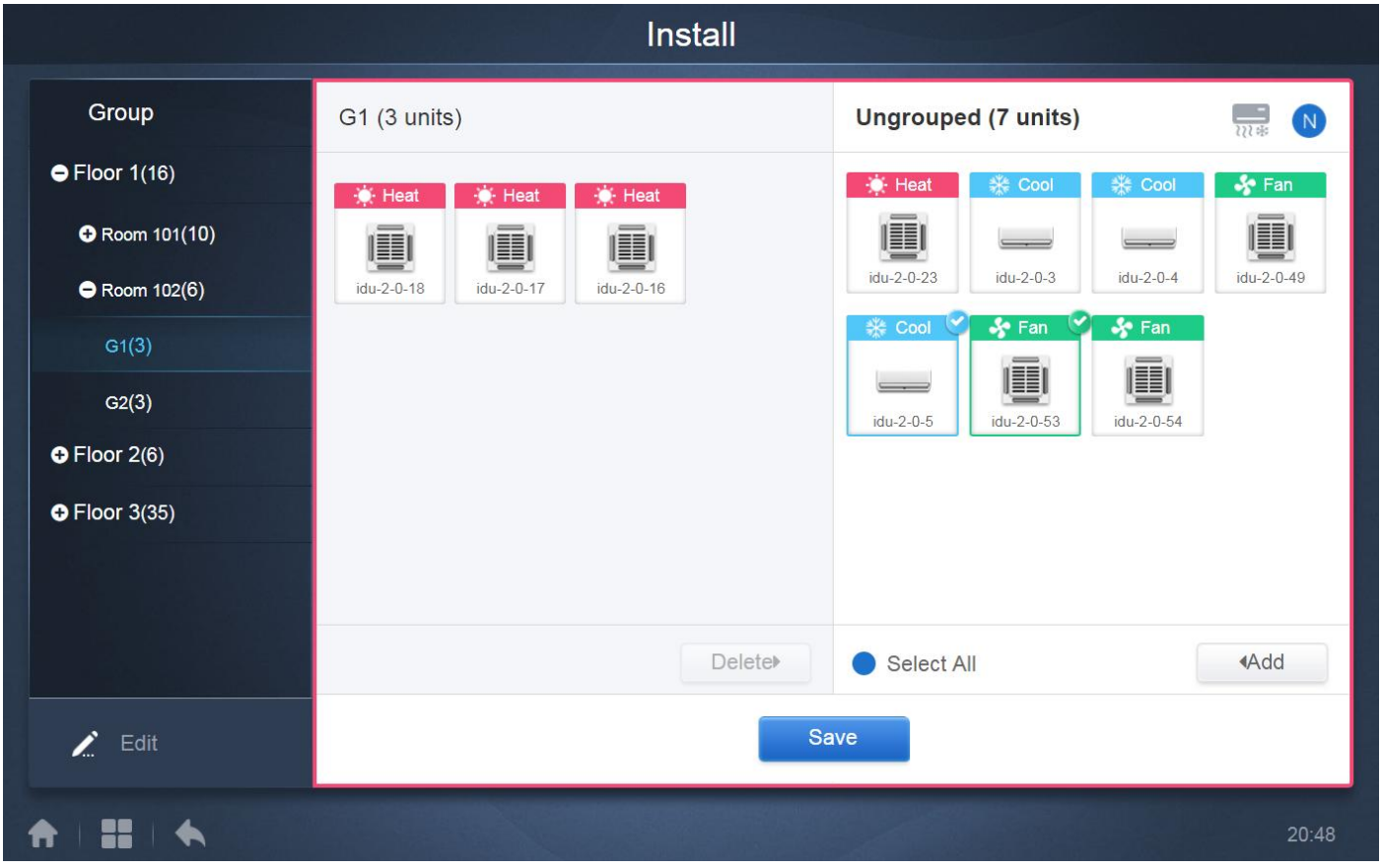
Tap the edit icon to go to the group name editor

Tap “Delete” to delete the group.

Note: Make sure you tap “Save” at the bottom of the page to save all create and edit operations. Otherwise, the changes will be discarded.

Add Indoor Unit to the Group

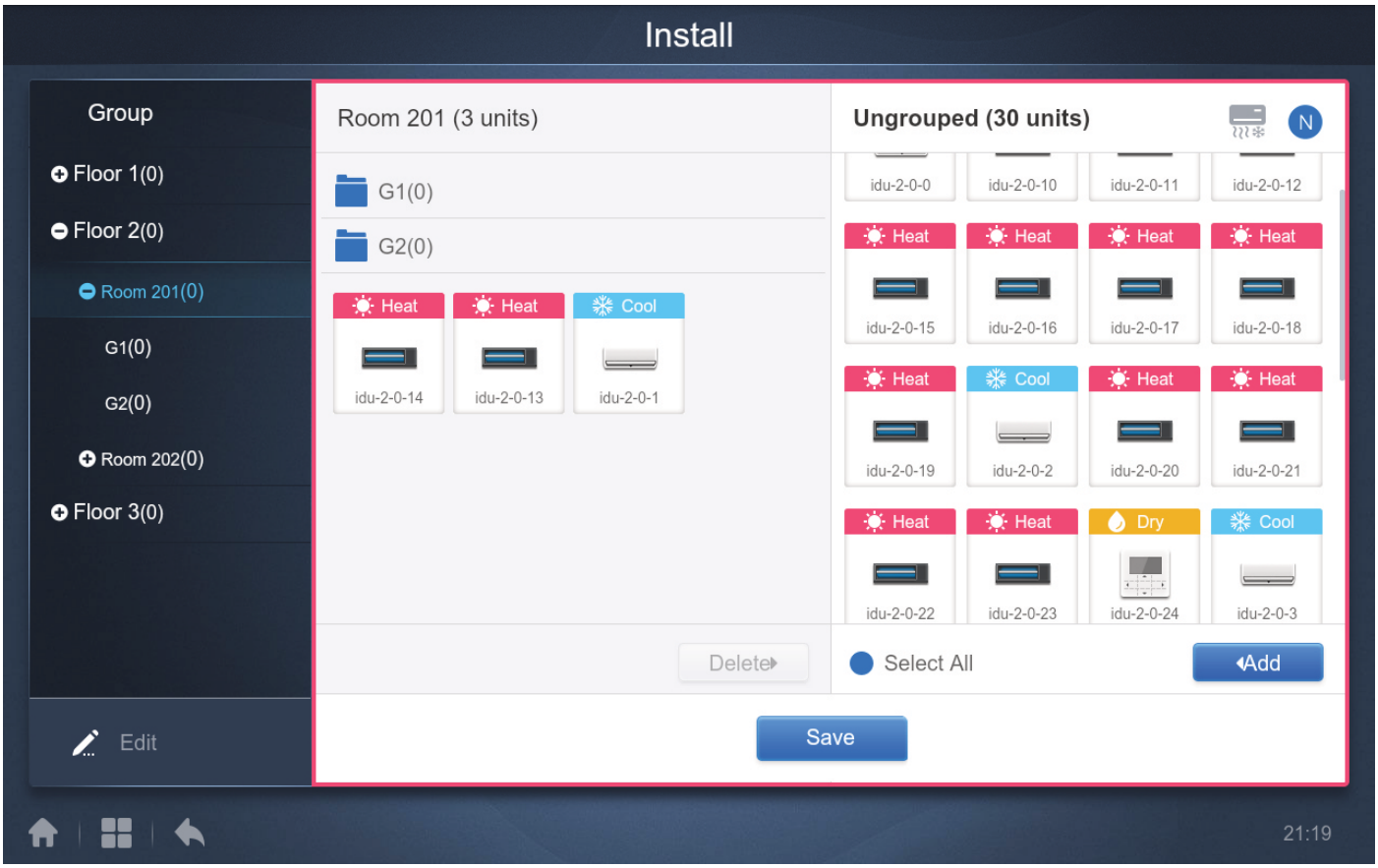
In the group page, you can add and delete indoor units in the group.

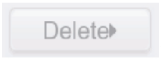


Select the indoor unit you need to operate from the group list on the left.

Tap 

to add the indoor unit tyo the corresponding group. If the selected group has subgroups, they are displayed as follows:



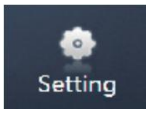
In the middle are, select the indoor unit to be deleted, tap 

to remove the indoor unit from the corresponding group.

Once the edits to the indoor units in the group have been completed, tap 

(at the bottom of page) to save the changes. If the changes are not saved and you directly switch to other groups, you will receive the following prompt, "Changes have not been saved. Save the changes?"

1.9 Setting

Tap 

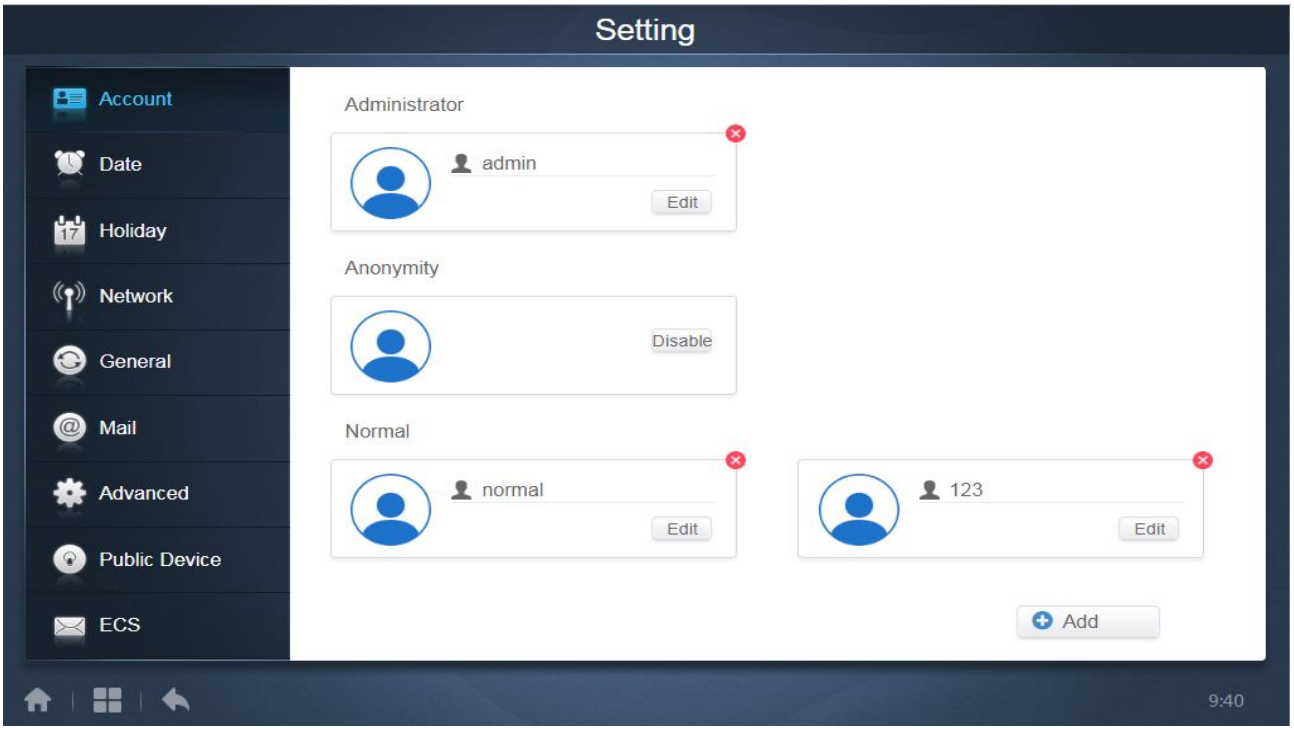
in the main page to go to the settings page. Default is the user management module

No	Description
1	List of available functions in the settings page. Tap to jump to the corresponding tab
2	Shows the details of different tabs

Now let us discuss the details of each of these functions one by one:

1.9.1 Account

Administrator



(Administrator Page)

The administrator account has permissions to add or remove accounts; along with that an administrator account has the permissions to change the passwords of other accounts. This account is basically for the Engineers or Service personnel, for the end user a normal account should be provided which has been described as below

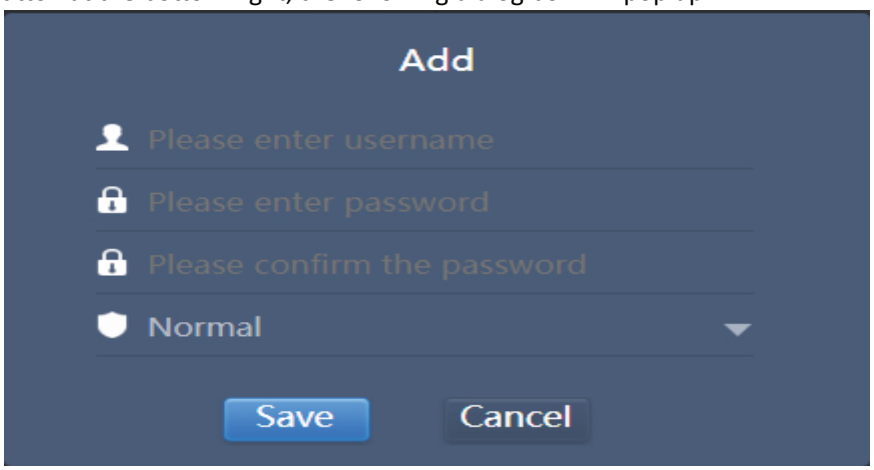
The default username and password for the administrator account are as follows:

Username: admin

Password: 1

Add Users:

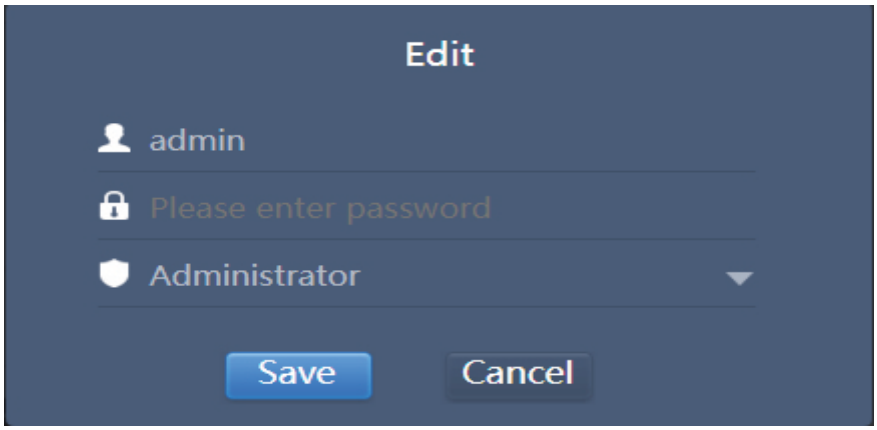
On clicking the “Add” button at the bottom right, the following dialog box will pop up:



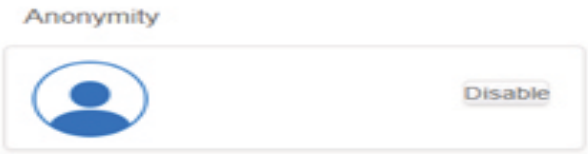
The user needs to add the username, password and select the permissions for the new user account.

Edit User

On clicking the Edit tab of the user account, the following dialog box would pop up , the password can be changed for the respective account.

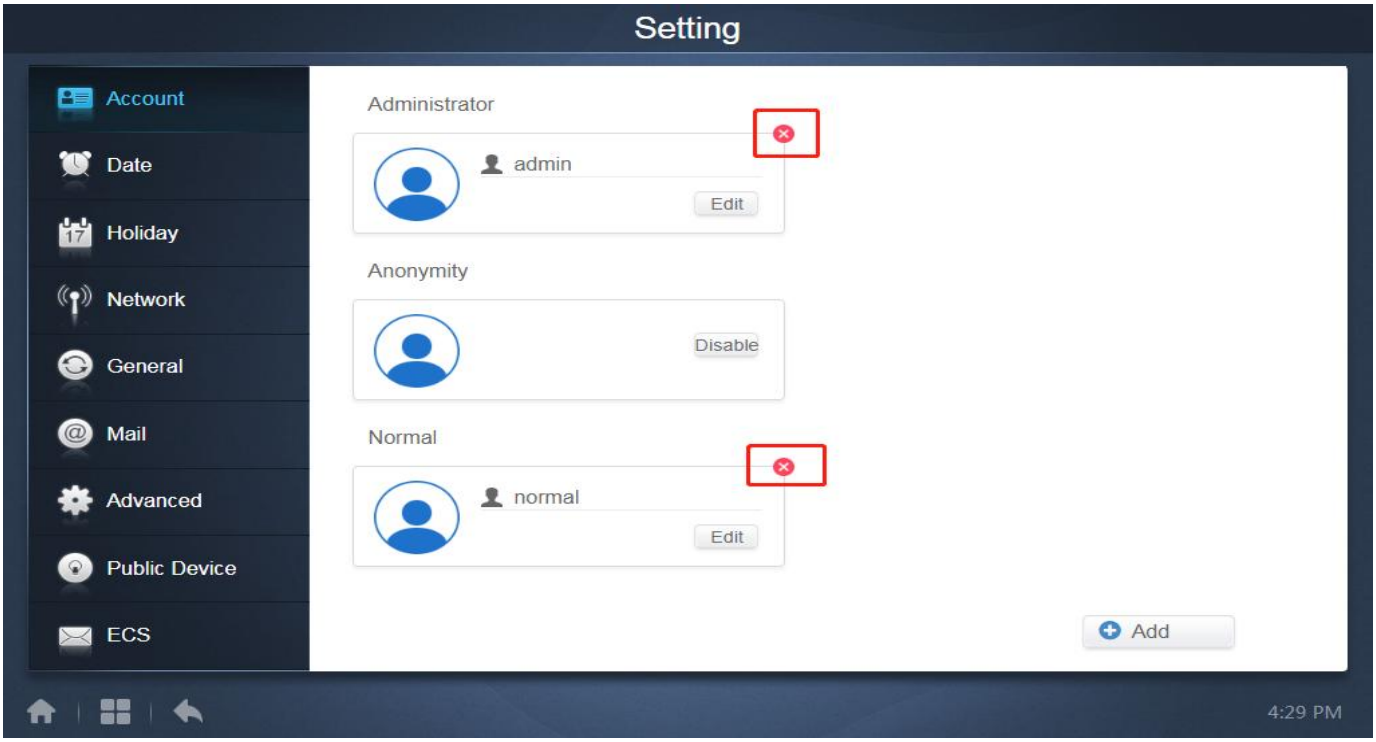


Disable the Anonymity Account

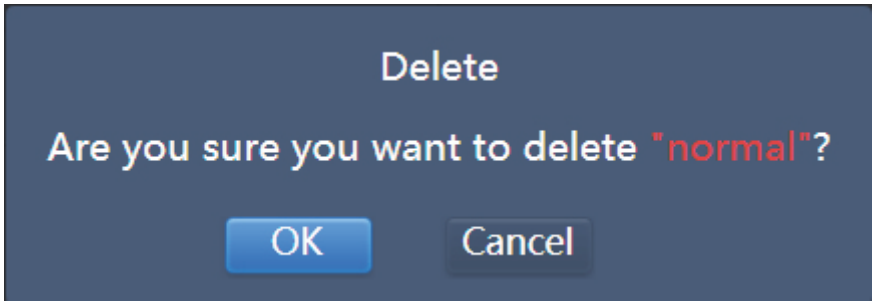


Clicking on disable would disable the Anonymity account.

Delete users



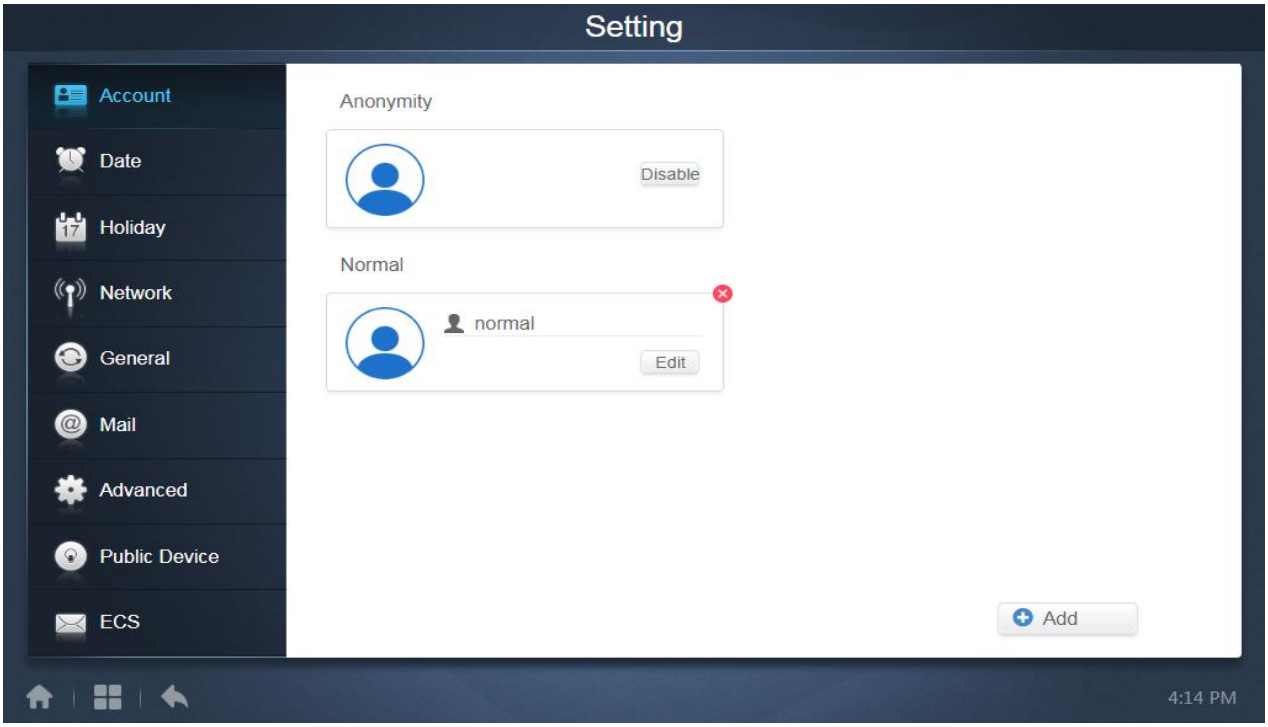
Clicking on the small cross on the top right of the account would open a dialog box promptly asking to delete the user account.



Clicking on “OK” would delete that particular account

Note-The administrator cannot delete his own account.

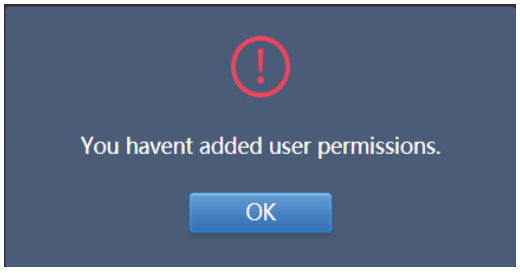
Normal account



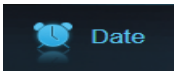
(Normal User Page)

The normal user cannot disable the Anonymity account or add or delete any other users. The normal users here can only change the password of his own account.

On clicking the “Add” button at the bottom right, the following prompt box would be shown:

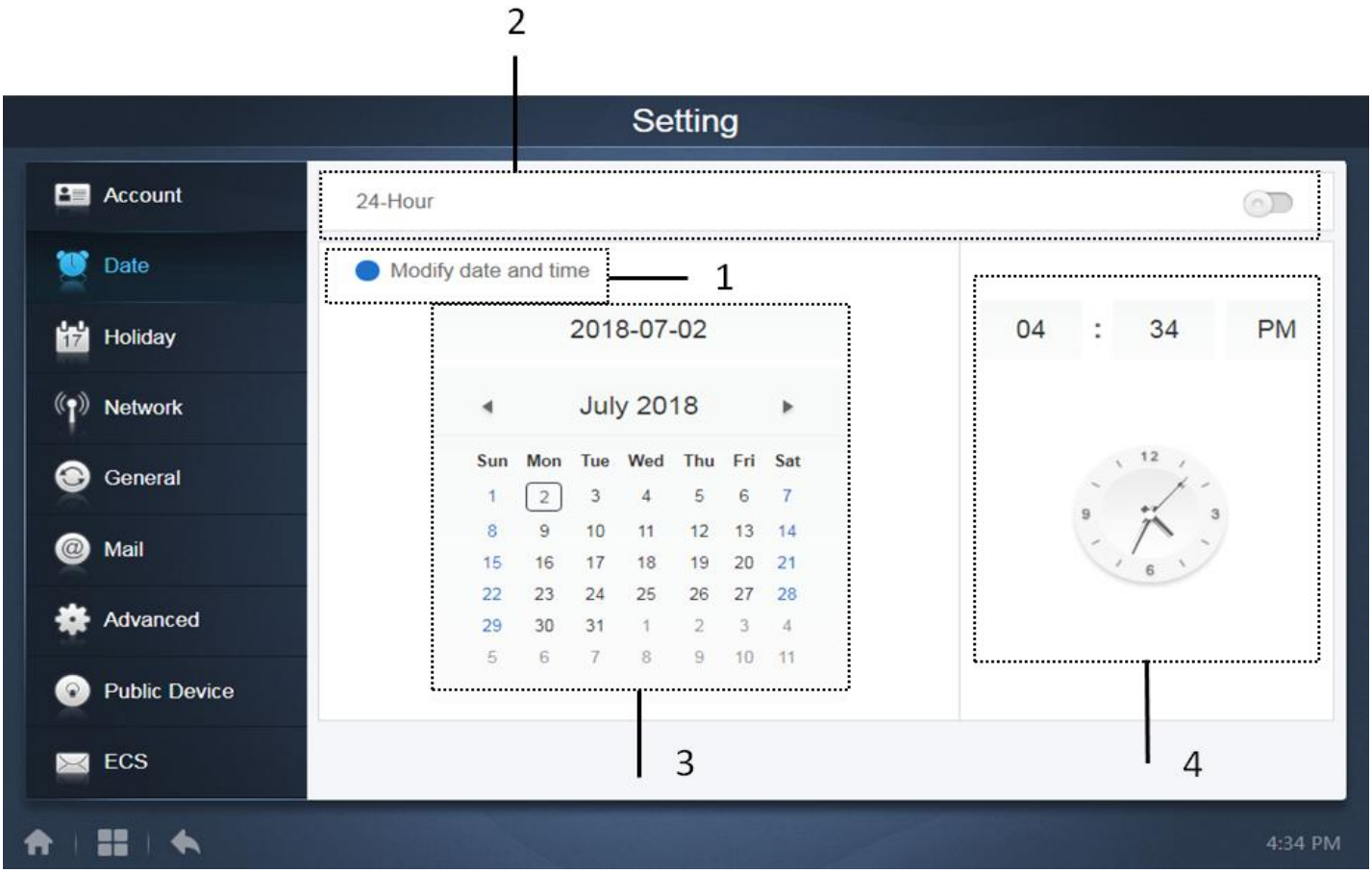


1.9.2 Date and Time Settings

Tap the list to go to the 

tab to set the date and time as shown in Figure. Default is the No Edit page. View the current date and time. Use "◀" and "▶" or any grey numbers that do not belong to this month to jump to another month. Tap to check
the blue icon on the left of Modify date and time" to enter the Edit mode as shown in Figure.

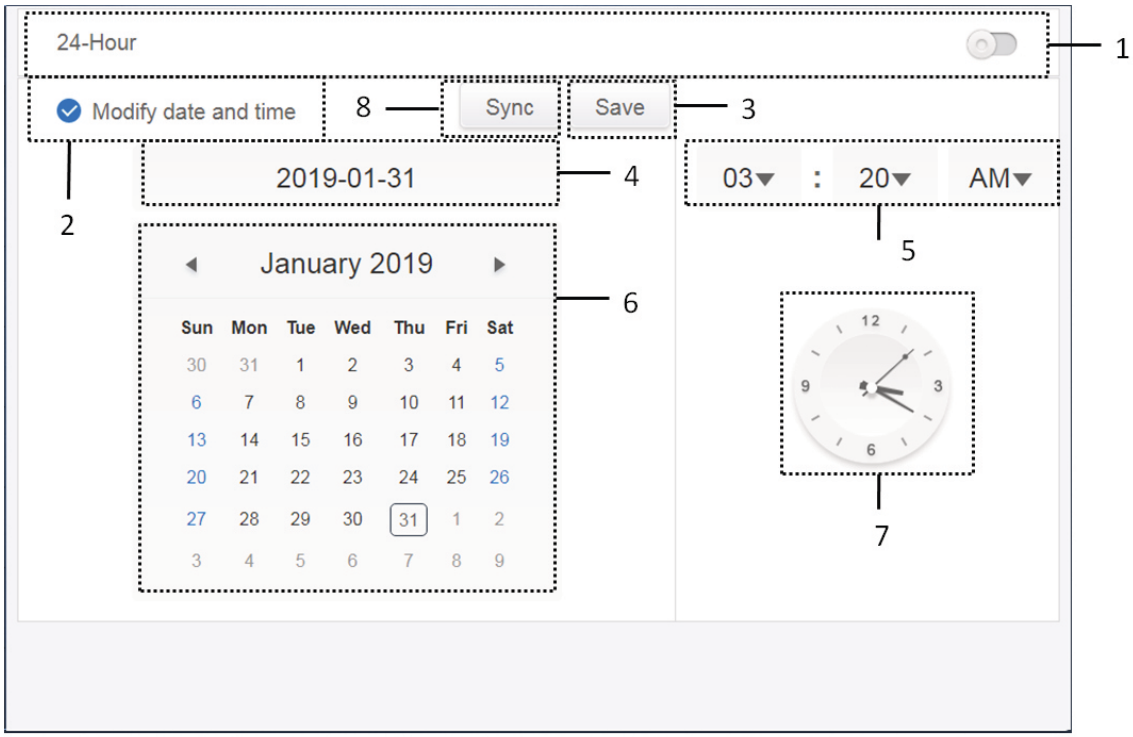
Default Display



(Default display)

No	Description
1	Clicking on this will open the Edit mode for the dare and time
2	The toggle switch is used to switch between the 12 hr and 24hr display of time
3	It shows the current date in the form of a calendar
4	It shows the analog as well as a digital clock showing the current time for the IMMP-BAC(A) gateway

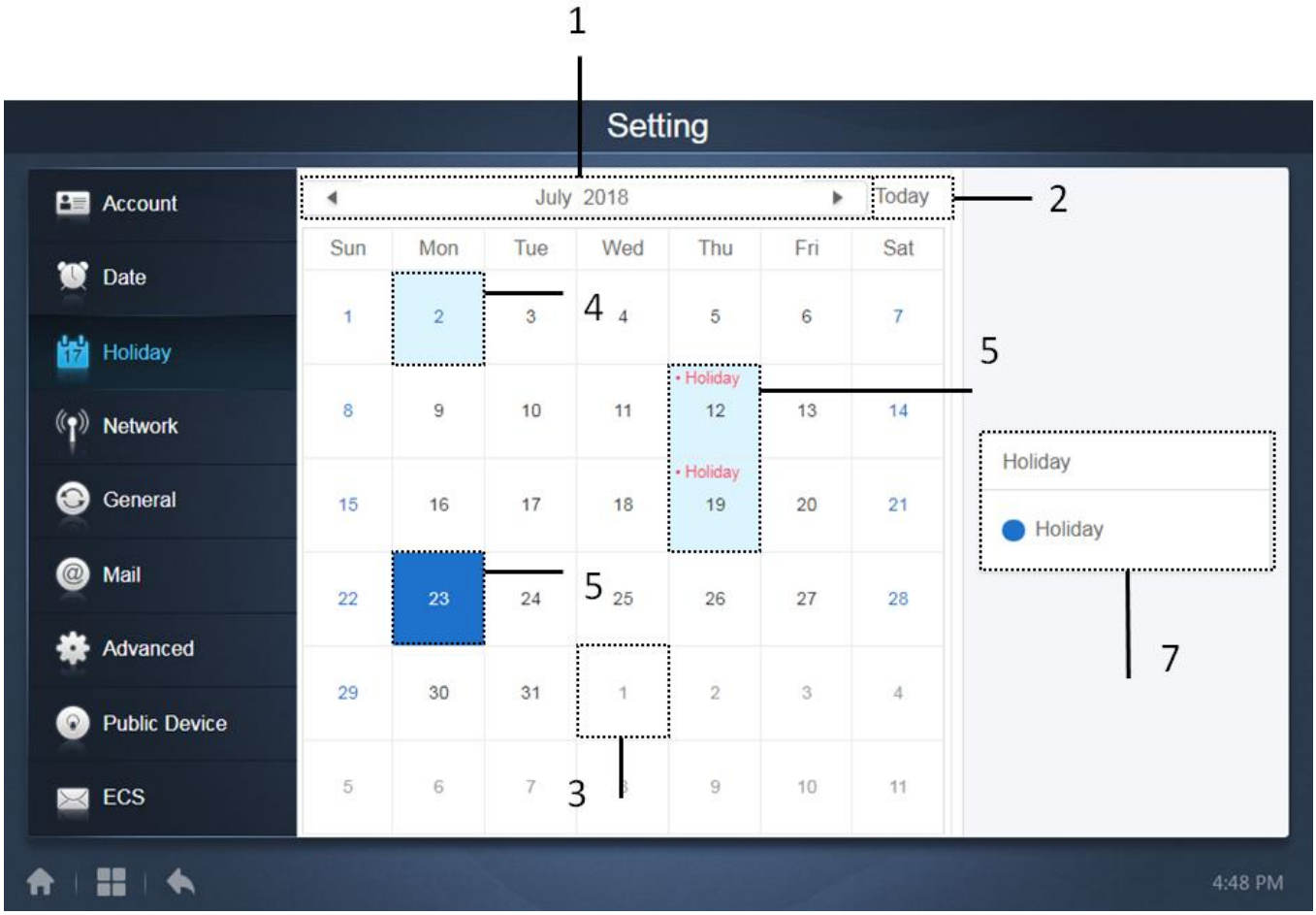
Edit Mode



(Edit Mode)

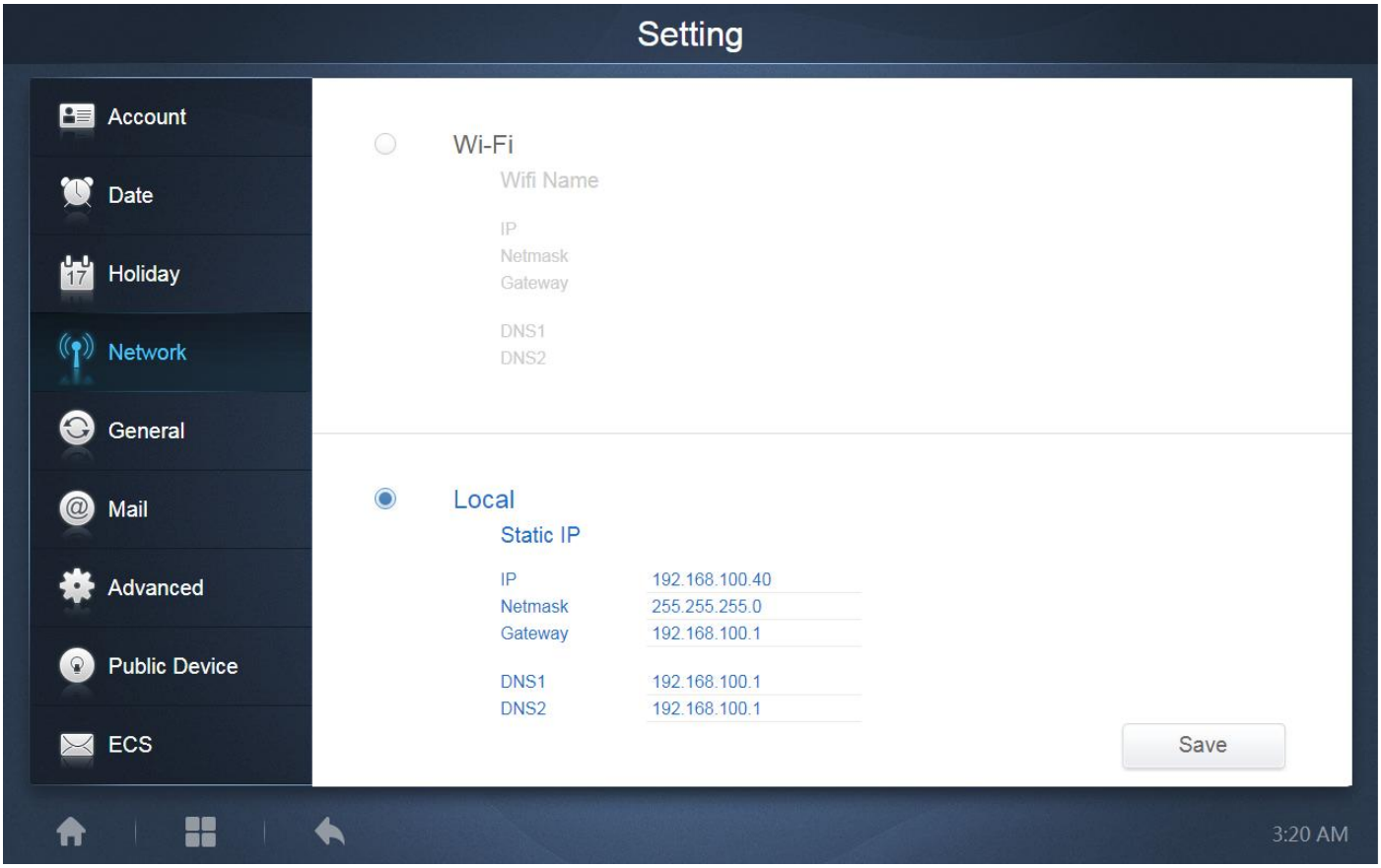
No	Description
1	Use to switch between 24-hour clock and 12-hour clock system. You can adjust the system timing system in both Edit and No Edit modes. When the slider is white and inactive, slide to the left, and the slider becomes blue and active, and the system switches to the 24-hour clock system. When the slider is active, slide to the right and the slider is now inactive, and system switches to a 12-hour clock system.
2	Tap the blue icon on the left side of "Modify date and time". Once this icon is checked, Edit mode is on. Tap again to uncheck the icon to exit the Edit mode, and all changes will be discarded.
3	Appears only when Edit is on to save the changes to the date and time. Tap to save the result and exit the Edit mode.
4	Displays the current system date when Edit is off. Displays the date selected when Edit is on.
5	Displays the current system time in the No Edit mode. Tap "▼" when Edit is on to activate the number selection list to adjust the time. Scroll the list to select the desired time, and close the list.
6	Displays dates in a calendar format with a solid box to frame today's date. Tap the grey numbers or "◀" and "▶" to change the month. When Edit is off, you can only view the calendar. When Edit is on, tap on any date to select and modify the date. Selected dates have a blue background.
7	Displays the current time in the form of a clock. Clock stops when Edit is on. Automatically skip to the modified time once the modified time is saved.

1.9.3 Holiday Settings



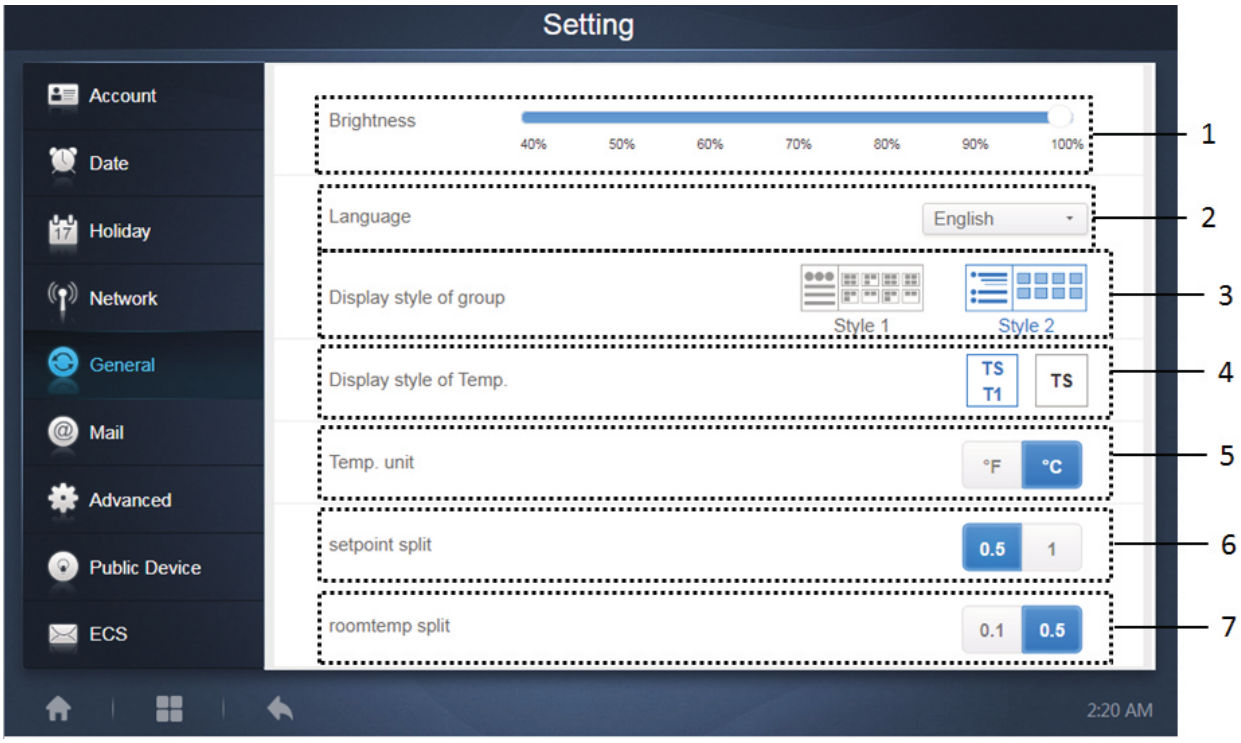
No	Function
1	Displays current year and month. Tap "◀" and "▶" to change the month.
2	Shortcut to return to the current system date. Tap to activate it immediately.
3	Dates in grey do not belong to the current displayed month. Tap to jump to the date that the grey number belongs to and select the date.
4	Light blue background colour and blue font for today's date.
5	Dates with light blue background and red text are marked as holidays.
6	Selected date has a dark blue background. Tap the dates in black or blue font to select the date.
7	Non-holidays are marked with ● . Holidays are marked with ●. Select the corresponding date to view its status. Tap the blue icon to switch the status.

1.9.4 Network Settings



In this page you can change the IP of the IMMP-BAC(A). Just click on the IP written in this page and you can edit the IP according to your will and requirement. Click on “Save ” save the changed IP settings

1.9.5 General Settings

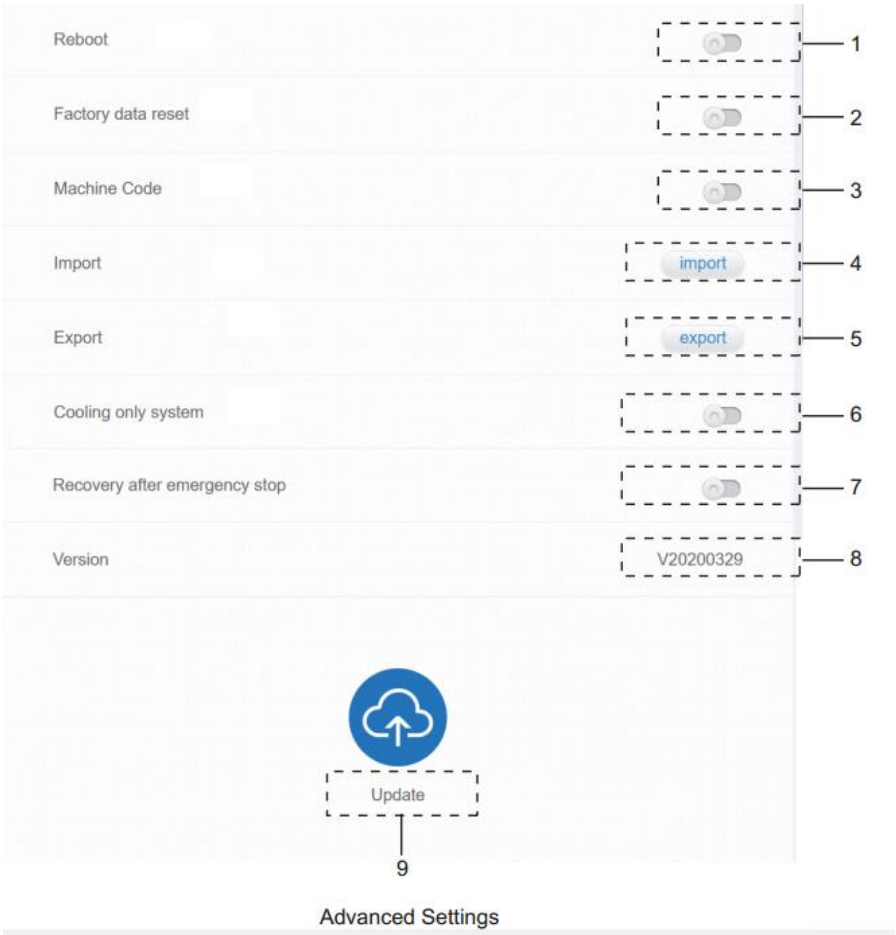


No	Function
1	This tab has no meaning for the IMMP-BAC(A) website
2	Changes the display language. Tap to activate the drop-down box, and tap to select the desired language.
3	Adjusts the group's display mode. Selected mode is highlighted in blue. Tap the grey icon to activate its mode. The two modes are mutually exclusive. The function targets the Group Navigation at the Device Monitor and Installation. Image on the right is related to the display of indoor units in the subgroups. Expand to display the indoor units in the subgroups on the right. Otherwise, the indoor units in the subgroups are merged into the subgroup folder and only the number of indoor units is displayed.
4	If the indoor ambient temperature for T1 should be displayed. Left is Display, right is not Displayed. Selected mode is highlighted in blue. Tap the grey icon to activate that mode. The two modes are mutually exclusive.
5	Unit of temperature. Selected mode is highlighted in blue. Tap the grey icon to activate its mode. The two modes are mutually exclusive.
6	This is to set the set point step values, which are to change the set point in steps of 0.5degree or 1 degree respectively. However, if you have selected °F, the set temperature interval can only be 1 and cannot be modified.
7	This is to set the set point step values, which are to change the room temperature in steps of 0.5degree or 1 degree respectively.

1.9.6 Mail Settings

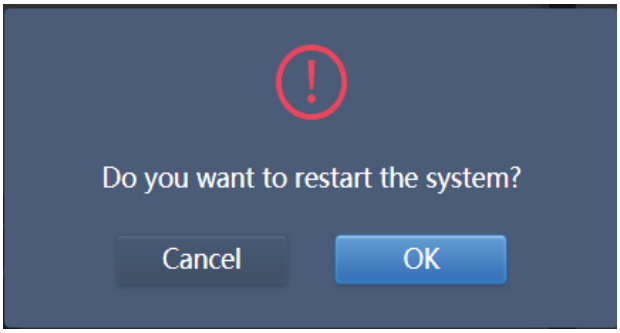
This function is not available for IMMP-BAC(A)

1.9.7 AdvancedSettings

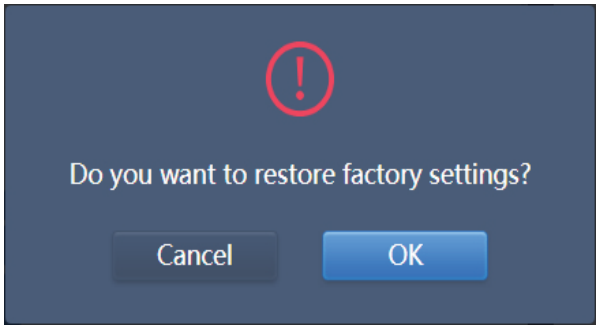


Advanced Settings

1. **Reboot:**On adjusting the slider, the following below shown dialog box will get opened. This function is to reboot the device

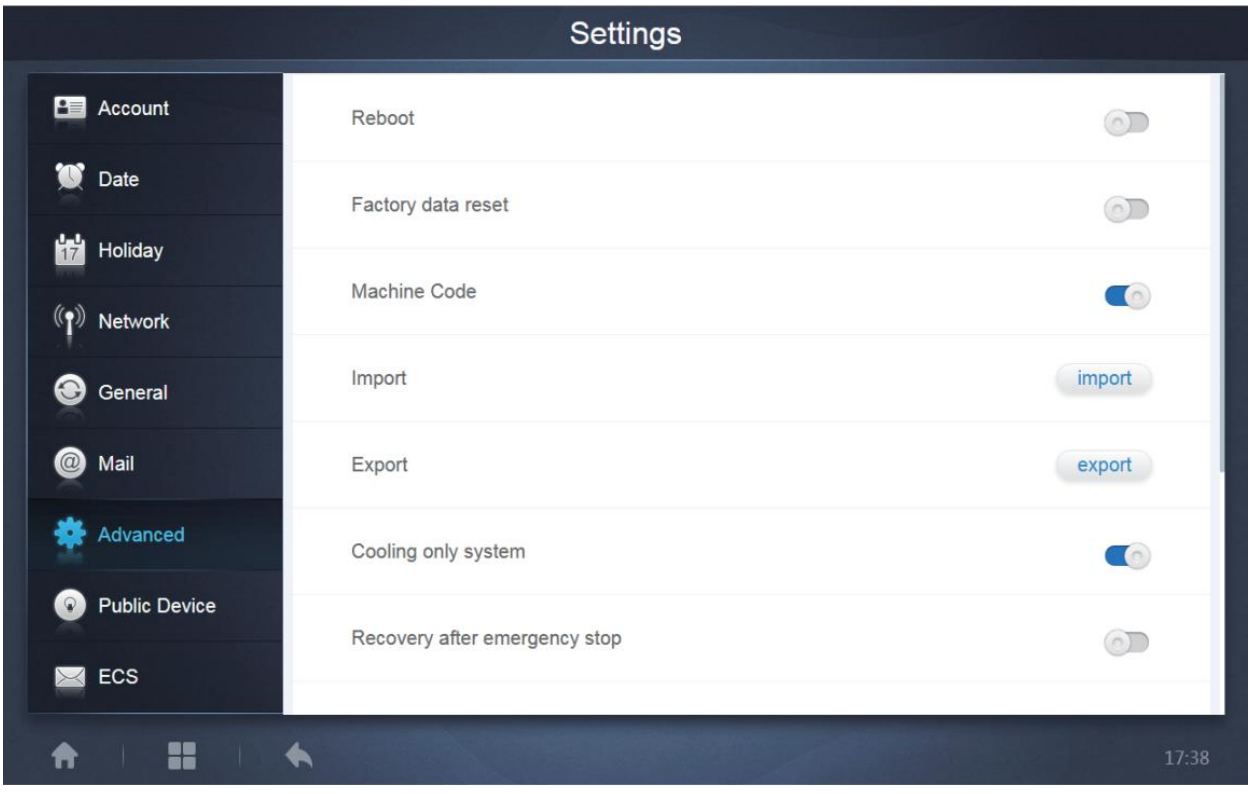


2. **FactorydataReset:**This button is to restore the factory settings in IMMP-BAC(A). On adjusting the slider, the following below shown dialog box will get opened. If you tap OK, it will clear all the topology information, schedules, history, operating duration, running records, energy statistics and the settings. Tap “Cancel” to cancel all operations and exit



3. **MachineCode:**Thissetting is to activate the Electricity Charge Distribution function for the IMMP-BAC(A) device. On clicking the slider, the following below shown dialog box would get opened. The subsequent QR code needs to be sent to MDV Technical Support Engineer for the Activation of the function.

Once, the power distribution function has been activated, the display will be as follows:



4. **Import:**This button allows you to import all the data present inside the touch screen controller. In case you want to change the old controller to a new one or the old controller is broken, you can transfer all the data from the old controller using the import and export function.

5. **Export:**This button allows you to export all the data present inside the touch screen controller. In case you want to change the old controller to a new one or the old controller is broken, you can transfer all the data from the old controller using the import and export function.

6. **CoolingOnlySystem:**If the controller is connected with cooling only system, click this slider to activate the controller to be used in cooling only mode.

7. **Recoveryafteremergencystop:**When this function is enabled, if the emergency stop is released, the touch screen centralized controller restores devices to the states that they were in before the emergency stop was engaged. (The touch screen centralized controller only restores the operating status of devices that are in the startup state at the time the emergency stop was triggered.) When this function is disabled, if the emergency stop is released, the touch screen centralized controller will not send a startup command.

Note: This function restores only the operating mode and set temperature of started devices. After restoration, the fan speed and angle may be different from those at the moment when the emergency stop occurred.

8. **Version:**This shows the current version of the IMMP-BAC(A). You must always tell what is the version of IMMP-BAC(A) which you are handling while talking with MDV Technical Support Engineer.
9. Tap the blue icon. The controller will automatically search for the update file in the inserted USB root directory. Follow the prompts on the screen to complete the operation.

   Note: Never modify the update file (including the file name). Otherwise, the system may fail to work.

1.9.8 Public Device

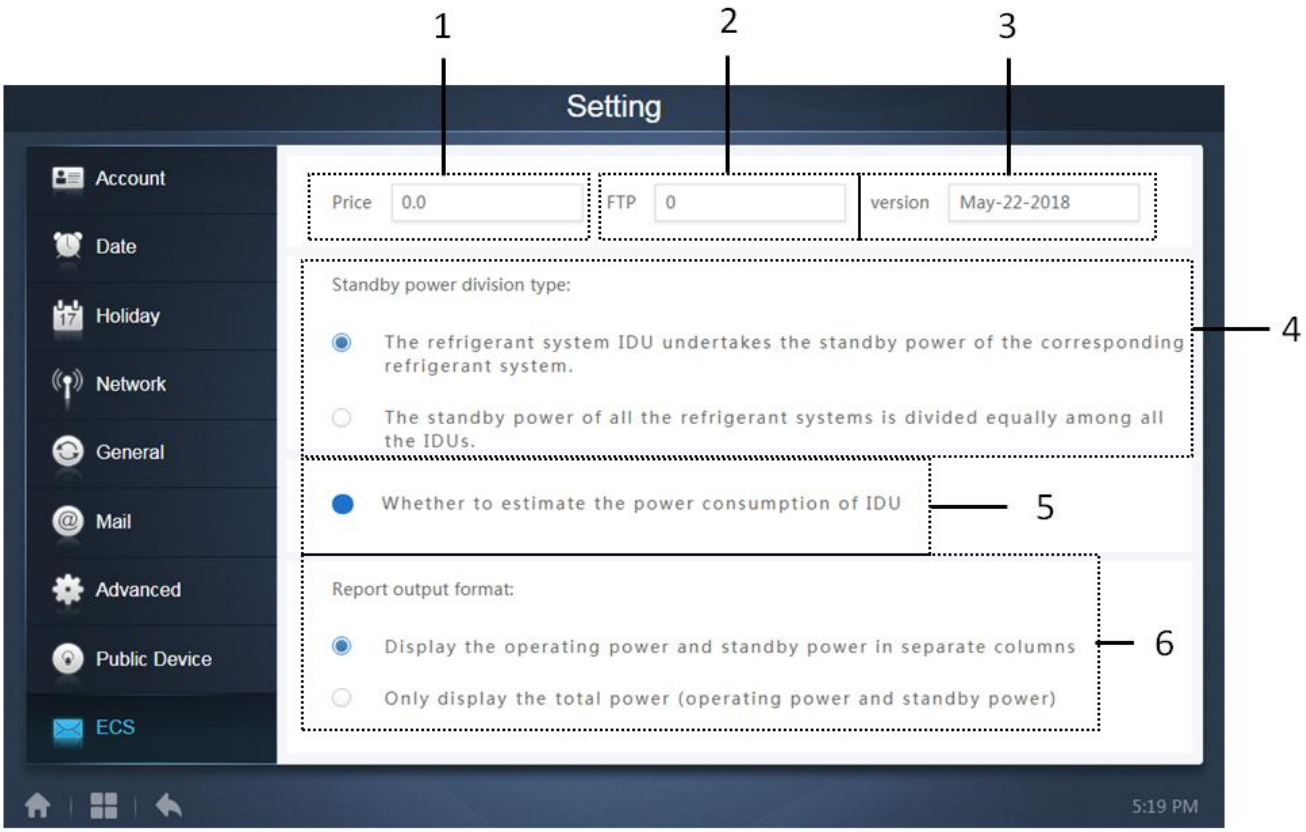
No	Function
1	Displays the group option. All the devices in the groups (including subgroups) are displayed on the right, and the groups are arranged based on the time of creation.
2	Changes the properties of the selected devices. Public refers to public devices. Enable refers to devices that have been enabled. Tap to select all the devices that can be selected. Tap "Cancel" to unselect all.
3	Method to display public devices.
4	Displays enabled devices. Selected device is marked by an icon at the top right corner. marked enabled devices that are selected. marked public devices that are selected.
5	Filters the devices in the group. Tap "All" to display all devices. Tap "Public" to display the public devices. Tap "Enable" to display all the enabled devices.

Note:

1. For those marked as Public devices, its power will shared to all enabled devices during power allocation.
   2. Power from public devices is shared equally to other devices where fees are being charged. It does not distinguish the time settings. Once it is set as a public device, all queries will see that device as a public devices (power allocation is only effective during the query, the database records the original file, and the calculation is performed only during the query).
   3. Devices in the wired controller group do not support this function.

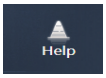
1.9.9 ECSSettings

This kind of setting is related to the energy consumption statistics function of the IMMP-BAC(A) gateway. The various functions under this have been described as below:

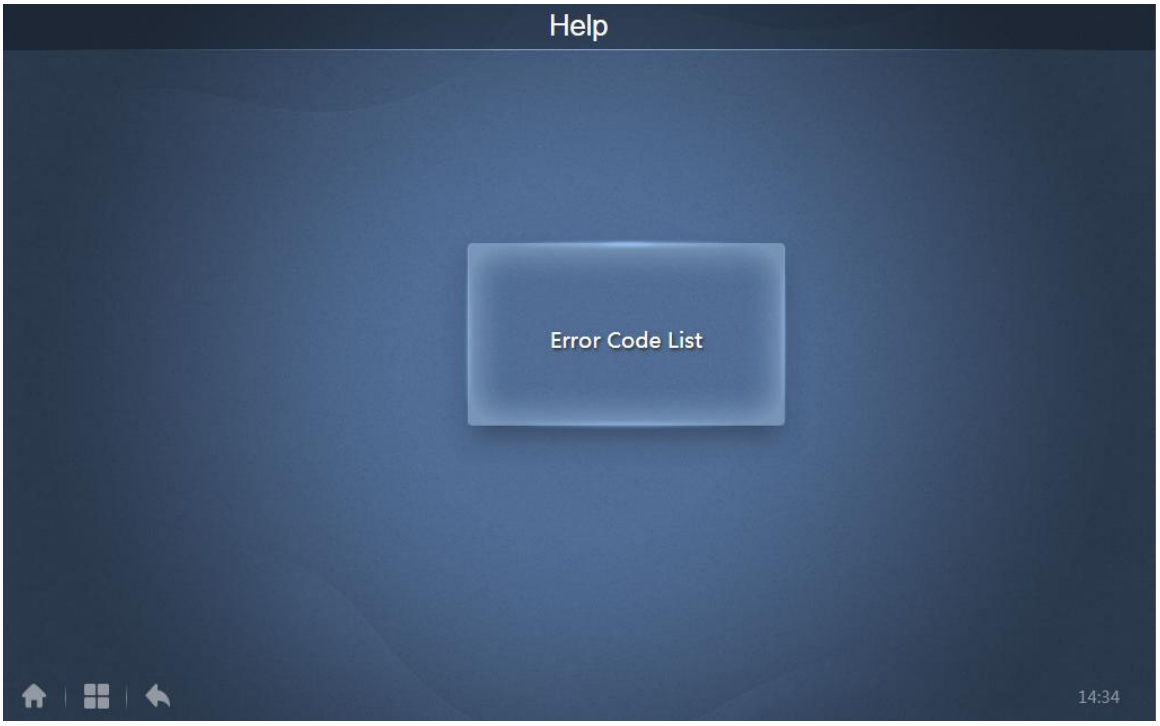


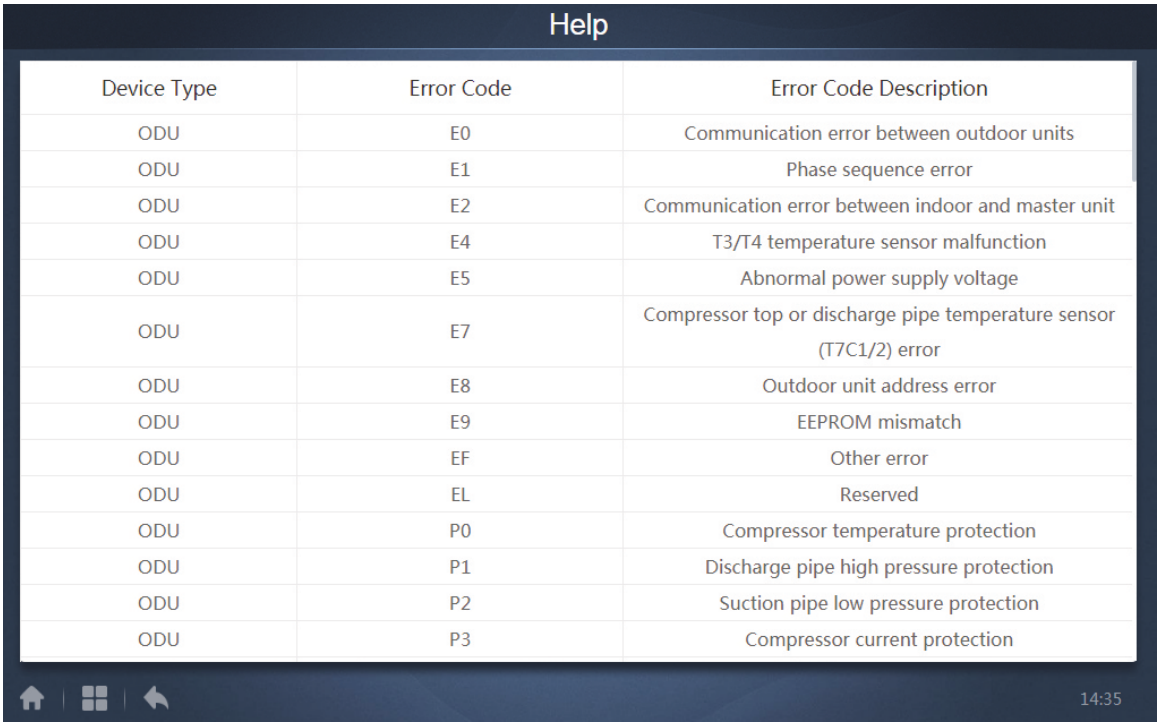
No	Function
1	It is to set the price of one unit for the Electricity consumption
2	FTP stands for file Transfer Protocol. This value is the same as the IP address of the computer. It is used to exchange information between IMMPRO software and IMMP-BAC(A)
3	It shows the version of the software of IMMP-BAC(A)
4	It is to select whether the Standby power of the Outdoor unit will be distributed in the Indoor Units running power of that particular system only or the standby power of all the outdoor units would be evenly distributed to all the operating indoor units irrespective of their system
5	Selecting this, it will also add the power consumed by the IDU. The power consumed here would be added on the basis of the power rating of the IDU and Electric heater written in the Edit page of the Install menu. Refer 2.7.1 section for the complete details
6	This is to select the display pattern in Energy Statistics Document

1.10 Help

Tap 

on the main page to go to the Help Module of the website of IMMP-BAC(A). Under this section, you can find the list of Error Codes both for the IDU and ODU which can be very helpful for the users.





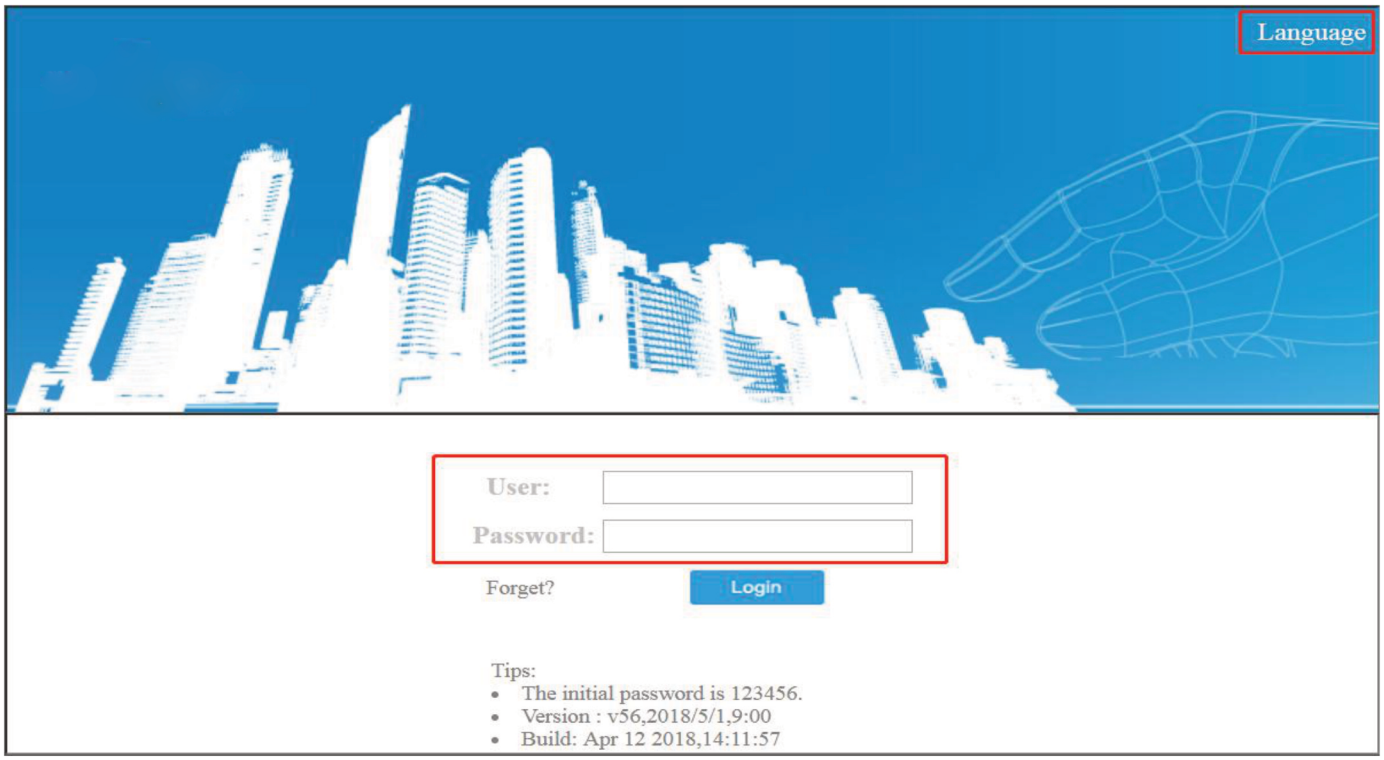
Device Type	Error Code	Error Code Description
ODU	E0	Communication error between outdoor units
ODU	E1	Phase sequence error
ODU	E2	Communication error between indoor and master unit
ODU	E4	T3/T4 temperature sensor malfunction
ODU	E5	Abnormal power supply voltage
ODU	E7	Compressor top or discharge pipe temperature sensor (T7C1/2) error
ODU	E8	Outdoor unit address error
ODU	E9	EEPROM mismatch
ODU	EF	Other error
ODU	EL	Reserved
ODU	P0	Compressor temperature protection
ODU	P1	Discharge pipe high pressure protection
ODU	P2	Suction pipe low pressure protection
ODU	P3	Compressor current protection

2 Functions as the BACnet BMS gateway

In this section, we have explained the functions that are being provided by the BACnet website of the IMMP-BAC(A) gateway. The various functions that are available on the IMMP-BAC(A) Bacnet website have been discussed in detail in this section.

2.1 Login Interface Description

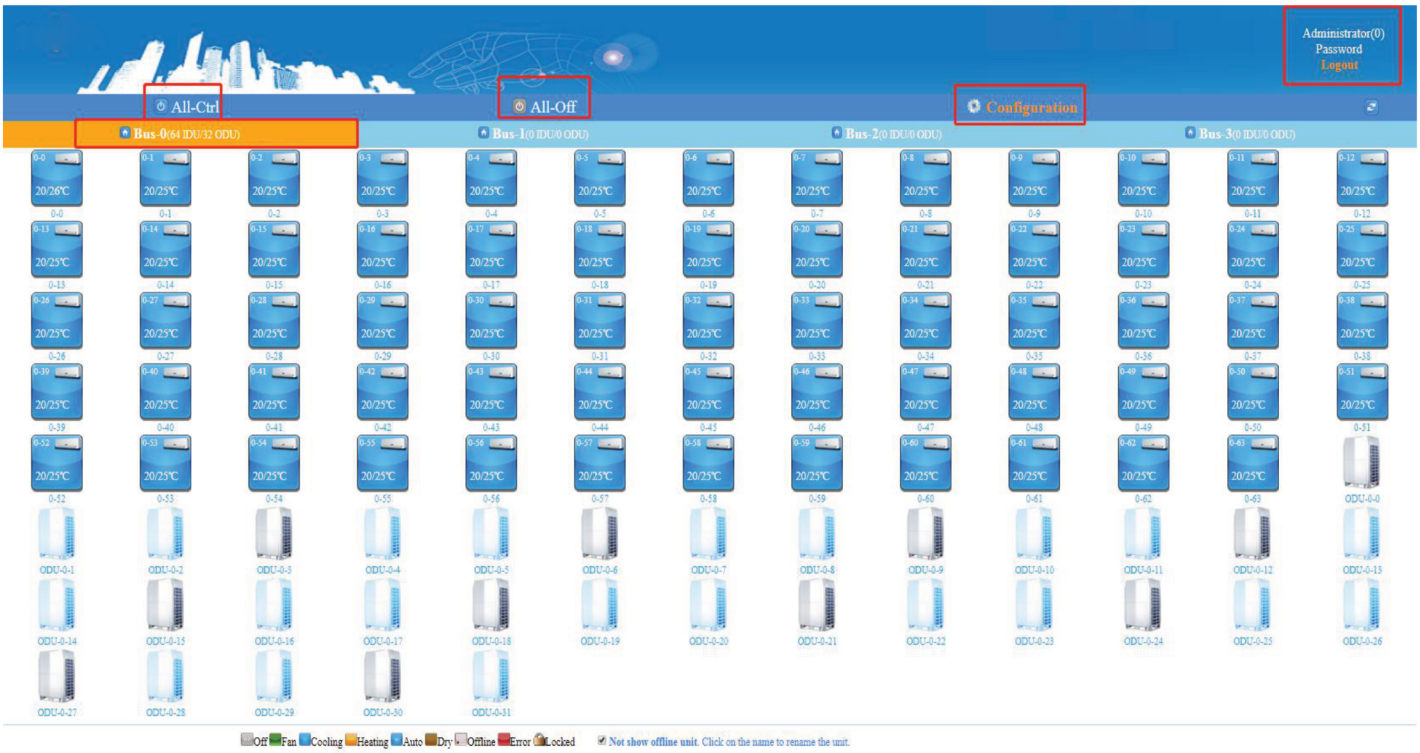
The default website to access the BMS gateway website of the controller is “https://192.168.1.8”. Below is shown the basic interface that the user will reach after successful login into the IMMP-BAC(A) BMS website. There are a few functions which are available to the user at the IMMP-BAC(A) website. When we open the IMMP-BAC(A) website for the first time, we will reach the login interface. The default username and password to log in the IMMP-BAC(A) BMS website are as follows:



User:admin
Password:123456
Default BMS website:https://192.168.1.8

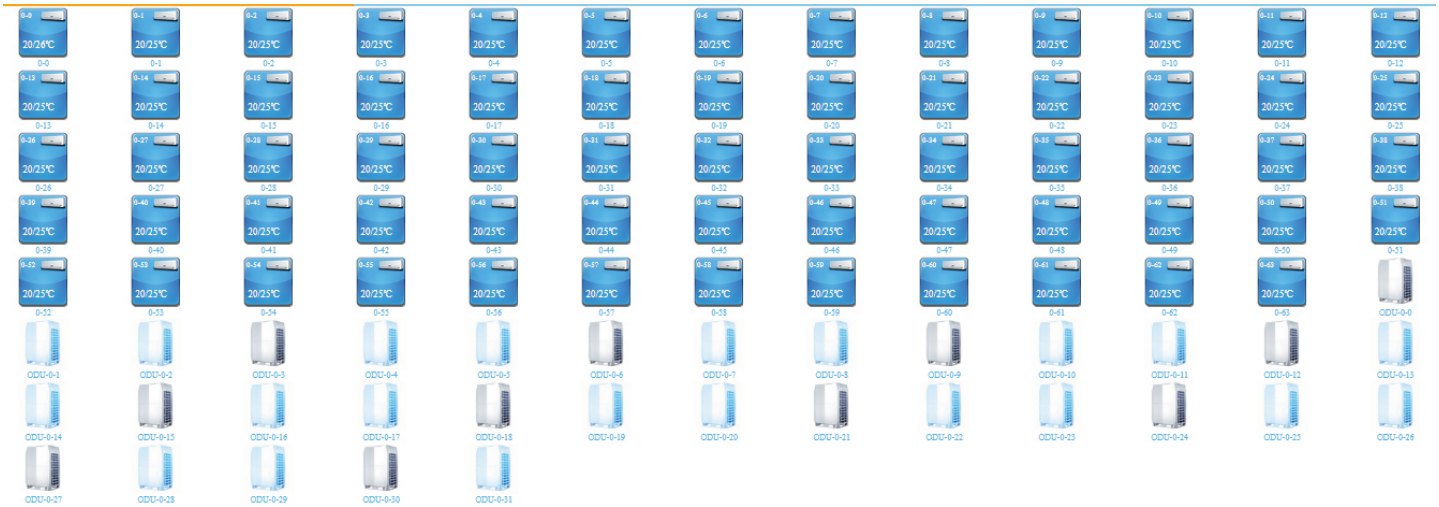
2.2 Web Interface description

Below is shown the main interface on which the user will reach, once he has finished the successful login into the BACnet BMS website of the IMMP-BAC(A) gateway (default IP: 192.168.1.8). As the interface picture shown below, we can see that there are a lot of functions which can be accessed from this website. Now, we will have a look at all these functions one by one.



Display Area:

The lower portion of the web- interface shows all the indoor and outdoor units connected with the controller and their status.



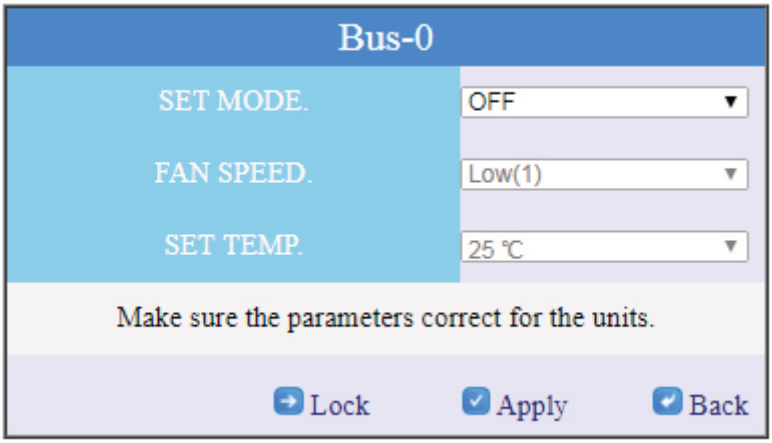
The colors of the ODU and IDU can provide a lot of information about the units just by looking at the units.

- **BusTab**

Bus stands for each port of the IMMP-BAC(A) controller. Click on a bus and its color will change to orange and it will show the indoor and outdoor units under this bus.

- **All-Ctrl**

Clicking on this tab will select all the indoor units together and the user can control the status of these IDUs together.



After completing these settings, the user can also lock these indoor units at this setting and thereafter the indoor units cannot be adjusted from remote and wired controllers.

- **All-Off**

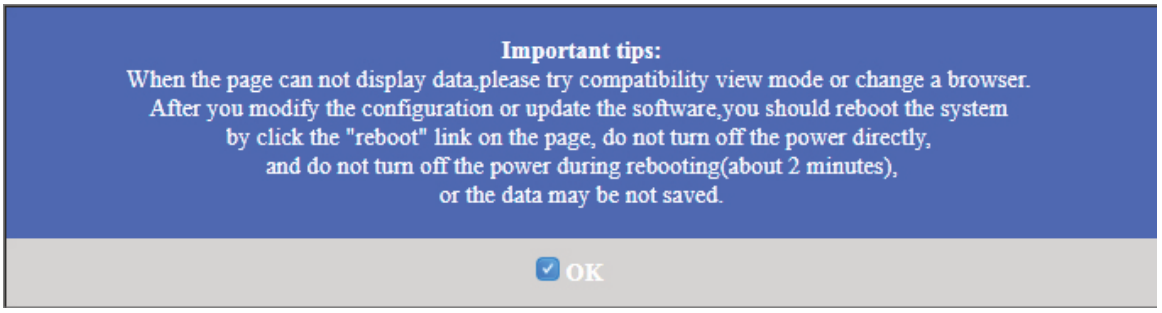
Clicking on this tab, gives the option to the user to turn off all the indoor units together just by one click.
When you click the All-Off tab, the following dialopg box as shown below would open and thereafter we can turn off all the units together.

- **Switch User**

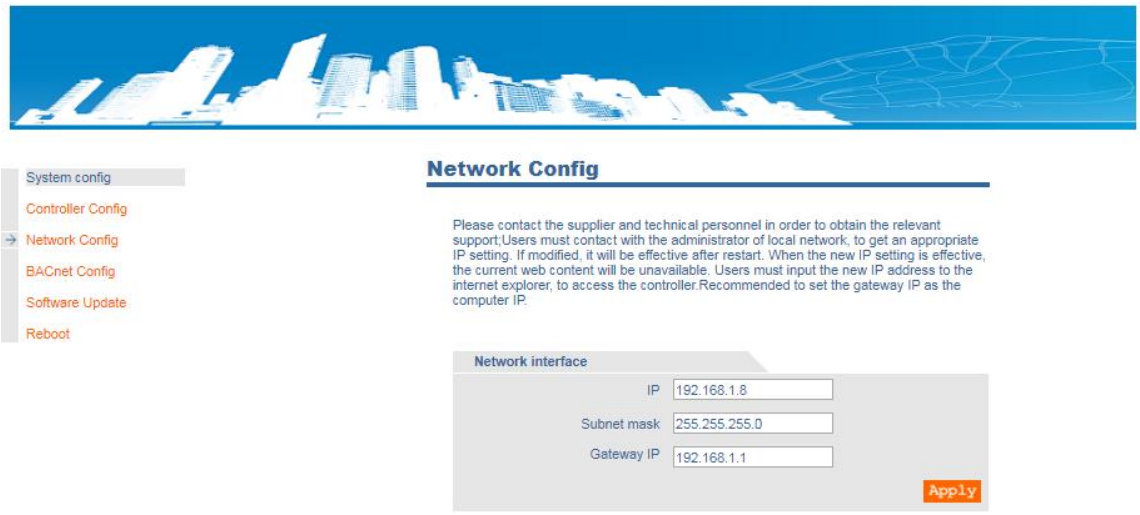
By clicking on the Logout tab, we can logout from the current user login and thereafter login with another user account.

- **Configuration**

Clicking on the Configuration will take the user to the Configuration menu.
Click “OK” on the dialog box that follows.



In the configuration menu, there are the following sub- menus for the user to address:



- **ControllerConfiguration-**Thisisused to configure the state of the controller.
- **NetworkConfiguration-**Inthis menu, we can change the IP of the gateway.
- **BACnetConfiguration-**Thistabprovides options for configuration according to the BACnet software.
- **SoftwareUpdate-**Inthis section, we can update the software of the IMMP-BAC(A) controller.
- **Reboot-**This tab is used to reboot the controller.

2.3 BMSfunctions

As we know that the IMMP-BAC(A) can be used as a gateway for BACnet BMS software, therefore the various functions available with the BACnet BMS software can be used after proper configuration of the controller with the BACnet BMS software. The details required for the installation as the BACnet BMS gateway have been provided in detail in the Installation & Commissioning part of this manual.

Part 4

Troubleshooting

1 BasicTroubleshooting

In this section, we will discuss about some basic troubleshooting for the IMMP-BAC(A). Also, are listed some preliminary steps that are required to be taken to eliminate these problems. Let us have a look at some of the basic troubles that may be encountered by the users while using IMMP-BAC(A).

1.1 Cannotopen anyof the IMMP-BAC(A) websites

Solution: Thefollowing are the two solutions that can be referred:

1. The first thing to check in such a situation is that the IMMP-BAC(A) gateway is connected with the LAN cable properly or not.
2. The second thing to check is that the IP settings have been completed properly. Refer to the Pre- Installation IP settings in the Installation and Commissioning part of this manual.
3. Make sure that you have entered the correct website address of the IMMP-BAC(A) gateway in the browser. In case the IP of the gateway was changed before, it should be made sure that the changed IP is used to access the website only.

1.2 Cannotfind the Equipment/Equipment is disconnected.

Solution: Thesolution for this problem is discussed in two parts as follows:

1. If no information is available for all the buses (ports), check that the wires are connected properly or not. If yes, please check whether ODU has started, whether wires are normal and the wiring sequence at the port is correct; if not, please check whether XYE line is closed.
2. If only part of equipment information is available and IDU information is absent, please check the PQE wires connecting IDU and ODU; If ODU (slave) information is absent, please check the H1H2E wires connecting ODUs; If the entire system is absent, please check H1H2E wires connecting systems.

1.3 Display Errorson the Webpage

Solution: Ifthere are display errors on the web page such as header errors and wrong icon placements; ensure that you use a browser with chrome 52 or later versions. Use the browser's mandatory refresh function to refresh the page (such as "Shift+F5" for the Google Chrome browser).

1.4 Wrong Error Codedisplayed

Solution: Theerror code shown in the indoor unit on the old platform is different from the error code shown in the nixie tube display of the indoor unit.

1.5 Power Allocation for PublicDevicesfor IMMPRO website

Solution: For those marked as public devices, its power will be shared to all enabled devices during power allocation. Power from public devices is shared equally to other devices where fees are being charged. It does not distinguish the time settings. Once it is set as a public device, all queries will see that device as a public device (power allocation is only effective during the query, the database records the original file, and the calculation is performed only during the query).

1.6 Failed to Upgrade the Equipment

Solution: While upgrading the IMMP-BAC(A) software, always make sure that the upgrade file is correct otherwise the upgrade would fail.

1.7 Failed to save the Group Operation in IMMP-BAC(A) (IMMPRO website)

Solution: Group operation: Make sure you tap "Save" at the bottom of the page to save all create and edit operations (delete operation excluded). Otherwise, the changes will be discarded.

1.8 Failed to execute the Weekly Plan for IMMP-BAC(A) (IMMPRO website)

Solution:

1. Check whether the expected execution date of weekly plan falls under a holiday period and “Holiday” option is not selected during setup.
2. Check whether the expected execution date of weekly plan is not in the cycle (for example, the cycle is configured that execution is carried out during working days only, while the expected execution date is at the weekends and is not a user-defined date. In this case, the weekly plan will not be executed on the expected date).
3. Check whether the expected weekly plan is within the valid period of the cycle.

1.9 Number of Indoor Units is less than the number of indoor units connected.

Solution: Forthe new units, certain wired controllers support the access of multiple IDUs where these IDUs will then form a “wired controller group”. In IMMP-BAC(A), these IDUs will be treated as a single virtual IDU and in the icon view in the “Control” page, the wired

2 APPENDIX

2.1 Appendix 1: Software Use Precautions

If there are display errors on the web page such as header errors and wrong icon placements, use the browser's mandatory refresh function to refresh the page (such as "Shift+F5" for the Google Chrome browser).

2.2 Appendix 2: Wired Controller Group for IMMP-BAC(A) (IMMPRO website)

For the new units, certain wired controllers support the access of multiple IDUs where these IDUs will then form a "wired controller group". In IMMP-BAC(A), these IDUs will be treated as a single virtual IDU, and in the icon view in "Device Monitor" the wired controller group of IDUs will have its own icon. The name of the wired controller group is the same as the name of the smallest IDU.

Note: Refer to the relevant manuals on wired controllers and indoor units for specific information on how to set the address of the wired controller group.

Condition	IDUs in Wired Controller Group
"Device monitor" icon view	When one or more IDUs are offline in the wired controller group, the wired controller group icon will display an offline status. When there are errors in one or more IDUs in the wired controller group, the wired controller group icon will display an error status, and the error code will be the error code in the IDU with the smallest address. When the wired controller group is normal, the wired controller group icon will show the operating state of the smallest IDU.
"Device monitoring" list view	In a list view, each IDU in the group is displayed on a separate line, and you can view the details of each IDU in the group.
"Statistical data", "Energy statistics"	Each IDU in the group is displayed on a separate line, and you can view the statistics of each IDU in the group.
Send control command	The same commands are sent to the wired controllers in the group.

2.3 Appendix 3: Export File Samplesfor IMMP-BAC(A) (IMMPRO website)

In this section, we have listed some of the samples of the reports that would be outputted by the IMMP-BAC(A)(IMMPRO website) system under various circumstances.

2.3.1 Energy Statistics Excel

The energy document outputted from IMMP-BAC(A) (IMMPRO website) will look as follows:

	A	B	C	D	E	F	G
1	Name	ID	IDU Operating Powe	IDU Standby Power	Total IDU Cost		
2	idu-2-0-63	2-63	20	10	60		
3	idu-2-0-62	2-62	25	10	70		
4	idu-2-0-61	2-61	30	10	80		
5	idu-2-0-60	2-60	31	10	82		
6	idu-2-0-59	2-59	23	10	66		
7	idu-2-0-58	2-58	26	10	72		
8	idu-2-0-57	2-57	29	10	78		
9	idu-2-0-56	2-56	32	10	84		
10	idu-2-0-55	2-55	36	10	92		
11							
12							
13							
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*The Energy cost depends up on the cost per unit set in the Settings part. Here we have set the cost to 2 per unit. It can be altered according to the local rate.

2.3.2 Operating Duration

Below is a sample of the excel document outputted by clicking the Operating Duration Tab in the Report function of IMMP-BAC(A) website.

	A	B	C	D	E	F	G
1	Name	Date	Total	C running	C standby	H running	H standby
2	idu-2-0-63	21-06-2018	10	10	10	0	0
3	idu-2-0-62	21-06-2018	11	12	10	0	0
4	idu-2-0-61	21-06-2018	12	11	10	0	0
5	idu-2-0-60	21-06-2018	12	14	10	0	0
6	idu-2-0-59	21-06-2018	12	18	10	0	0
7	idu-2-0-58	21-06-2018	12	29	10	0	0
8	idu-2-0-57	21-06-2018	13	2	10	0	0
9	idu-2-0-56	21-06-2018	15	2	10	0	0
10	idu-2-0-63	21-06-2018	19	18	10	0	0
11							
12							
13							
14							
15							
16							
17							
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2.3.3 RunningRecord

Below is a sample document for the excel file exported from the running record tab of the Report function.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	Operating Duration	Name	Type	Group NO.	ID	Mode	Setpoint	C Setpoir	H Setpoir	Fan	Room temp	Error coc	C setpoir	H setpoir	Mode limi	WDC limit	RC limit	Fan limit	ON/OFF limi	Swing
2	21-06-2018 17:11	idu-2-0-63	0	0	2-63	Offline	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3	21-06-2018 16:38	idu-2-0-63	0	0	2-63	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
4	21-06-2018 16:38	idu-2-0-63	0	0	2-63	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
5	21-06-2018 16:38	idu-2-0-63	0	0	2-63	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
6	21-06-2018 16:37	idu-2-0-63	0	0	2-63	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
7	21-06-2018 16:37	idu-2-0-63	0	0	2-63	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
8	21-06-2018 16:37	idu-2-0-63	0	0	2-63	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
9	21-06-2018 16:37	idu-2-0-63	0	0	2-63	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
10	21-06-2018 09:59	idu-2-0-63	0	0	2-63	Offline	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11	21-06-2018 09:59	idu-2-0-63	0	0	2-63	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
12	21-06-2018 09:59	idu-2-0-63	0	0	2-63	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
13	21-06-2018 00:00	idu-2-0-63	0	0	2-63	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
14	20-06-2018 18:35	idu-2-0-63	0	0	2-63	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
15	20-06-2018 18:33	idu-2-0-63	0	0	2-63	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
16	21-06-2018 17:11	idu-2-0-62	0	0	2-62	Offline	--	--	--	--	--	--	--	--	--	--	--	--	--	--
17	21-06-2018 16:38	idu-2-0-62	0	0	2-62	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
18	21-06-2018 16:38	idu-2-0-62	0	0	2-62	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
19	21-06-2018 16:38	idu-2-0-62	0	0	2-62	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
20	21-06-2018 16:37	idu-2-0-62	0	0	2-62	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
21	21-06-2018 16:37	idu-2-0-62	0	0	2-62	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
22	21-06-2018 16:37	idu-2-0-62	0	0	2-62	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
23	21-06-2018 16:37	idu-2-0-62	0	0	2-62	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
24	21-06-2018 09:59	idu-2-0-62	0	0	2-62	Offline	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25	21-06-2018 09:59	idu-2-0-62	0	0	2-62	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
26	21-06-2018 09:59	idu-2-0-62	0	0	2-62	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
27	21-06-2018 00:00	idu-2-0-62	0	0	2-62	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
28	20-06-2018 18:35	idu-2-0-62	0	0	2-62	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
29	20-06-2018 18:33	idu-2-0-62	0	0	2-62	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
30	21-06-2018 17:11	idu-2-0-61	0	0	2-61	Offline	--	--	--	--	--	--	--	--	--	--	--	--	--	--
31	21-06-2018 16:38	idu-2-0-61	0	0	2-61	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
32	21-06-2018 16:38	idu-2-0-61	0	0	2-61	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
33	21-06-2018 16:38	idu-2-0-61	0	0	2-61	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
34	21-06-2018 16:37	idu-2-0-61	0	0	2-61	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
35	21-06-2018 16:37	idu-2-0-61	0	0	2-61	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--
36	21-06-2018 16:37	idu-2-0-61	0	0	2-61	OFF	--	--	--	--	-20	E3	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimitec	Unlimited	Unlimited	--

*NOTE: The IMMP-BAC(A) can only store the data for last 2 months

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