

ELECTRONIC CONTROL UNIT

MicroBMS



OPERATION & INSTALLATION MANUAL

January 2005



CE Declaration of conformity

Under our own responsibility, we declare that the products designated in this manual comply with the provisions of the EEC directives listed hereafter and with the national legislation into which these directives have been transposed :

Low Voltage Directive (LVD) 73 / 23 / EEC
Electro-magnetic Compatibility Directive 89 / 336 EEC



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Notes

Important Notice

The function of the uBMS will vary on Airwell model air conditioners. Please consult your local Airwell representative for actual model specifications.

Introduction

Our new control unit has been designed for managing the system operation and temperature control of both individual and communal installations.

Being easy to use, it provides effective management from 1 to 15 different temperature zones and up to 32 units maximum.

For each one of the controlled zones, the user can alter the set temperatures for heating and cooling modes, and/or select ventilation fan speeds, by a simple programming procedure.

With the aid of a simple RS 485 communication bus (2 screened twisted wires) the panel provides individual control, in each of the zones, of the following

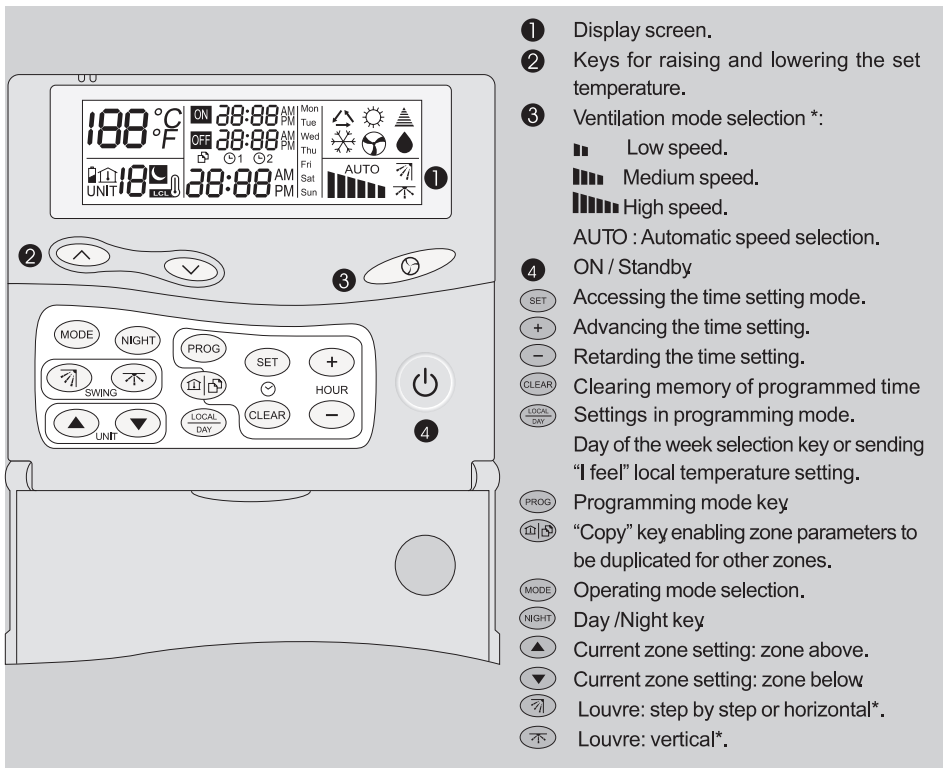
functions :

Dual programming of time and day of the week, control of ON / OFF, standby and operating modes, ventilation speed (LS, MS, HS, Auto) and set temperatures.

This programming enables 2 time periods to be selected :

- Either individually (for each zone).
- Or globally (for all zones).
- Motorised Louvres operation control*.
- Operating mode.

Description



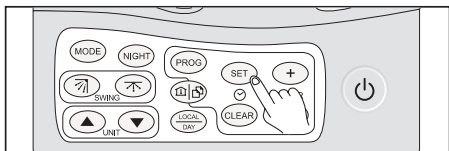
* Depending on the installation and the model of air conditioner used.

Quick settings

Follow the procedure below if your control panel is already installed and wired on site and you just want to set the time, day and basic parameters :

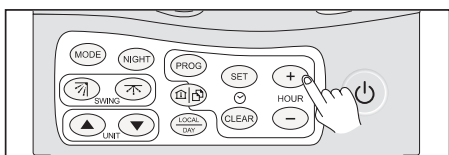
To access time and day settings

Press the **SET** key until the time and day values start flashing.



Setting the time

To set the time, press the **+** or **-** keys marked HOUR to advance or retard the time.



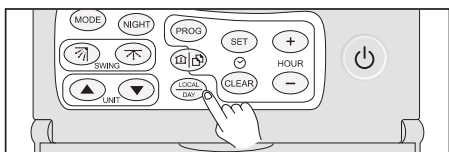
Tip : If you keep pressing on the **+** or **-** key the scrolling speed will increase to make time setting quicker

Time is set on a 24 hours basis.

If the day is already set, press the **SET** key again for a few seconds to validate your setting, or wait for 20 seconds without touching the keyboard. Otherwise, continue the procedure.

Setting the day

To set the day, press the **LOCAL DAY** key to display the corresponding day symbol. The day of the week flashes on the display during the setting procedure.



The days of the week are displayed as follows :

Mon : Monday

Tue : Tuesday

Wed : Wednesday

Thu : Thursday

Fri : Friday

Sat : Saturday

Sun : Sunday

Press the **SET** key for a few seconds to validate your setting, or wait for 20 seconds without touching the keyboard.

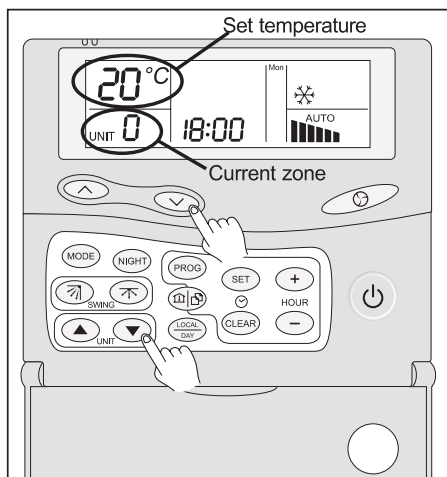
Now the time and date are set. Retrace this procedure for summer time / winter time changes or in the event of a power cut lasting longer than 24 hours.

Setting the desired temperature

Press the keys **^** and **v** to set the desired temperature in the zone displayed.

The zone is selected by using the **▲** and **▼** keys marked UNIT

If you wish to set the set temperature for all units (in all zones), you just have to set the set temperature for the zone 0.



In-depth programming

Programme function

The programme function enables units in one or several zones to be commanded automatically. The command times and operating parameters must comply with the premises' occupancy profiles and the desired level of comfort.

There are two types of programmes:

1) Programme with two commands: For this type of programme, a single timer is used to send a single ON command and a single OFF command.

Example:

1
ON: 9 h 00
OFF: 18 h 00

2) Programme with four commands: Two timers are used for this type of programme to send two ON commands and two OFF commands

Example:

1	2
ON: 8 h 30	ON: 15 h 00
OFF: 12 h 30	OFF: 20 h 10

Activating a programme

To access the programme menu, press the key for a period of 3 seconds.

The icon ON: - :- flashes on the screen.

The 1 icon is displayed.

Use the UNIT keys to select the zone to be programmed.

Press the key repeatedly to choose the programme execution day

Choose:

Operating mode by pressing the key

Fan (ventilation) speed with the key
Set the temperature to be applied with the

and keys

Use the and HOUR keys to set the time when the ON command must be executed.

Briefly press the key to validate this command and move on to the next step.

The icon OFF: - :- flashes on the screen.

Use the and HOUR keys to set the time when the OFF command must be executed.

You do not need to set any parameters for this command.

At this level, there are two possibilities, depending on the type of programme

1) If you enter a programme with two commands.

Press the key for 2 seconds.

The programme is activated and you can alter it at will.

2) If you enter a programme with four commands.

Briefly press the key to validate the timer 1 setting and move on to timer 2 2

Repeat the same operation as for timer 1 by choosing the desired operating parameters with the same keys as for timer 1.

After having completed your parameters selection, press the key for 2 seconds.

The programme is activated and you can alter it at will.

Zone 0 programme

A programme entered for zone 0 will be common to all the other zones.

We advise you to use the zone 0 programme to set the OFF commands only during the hours when the zones are unoccupied. Accordingly during period of inoccupation, if an ON command is made manually for a period of occupation not planned in the programme, the zone 0 programme enable the unit to be returned to OFF mode after the unplanned occupation. This provides for energy savings by avoiding the unit operating without purpose in ON mode when the zone is unoccupied.

After 20 seconds of inactivity in programming mode, the unit exits this mode automatically. After returning to command mode, the unit will automatically move to the last zone commanded and will display its status.

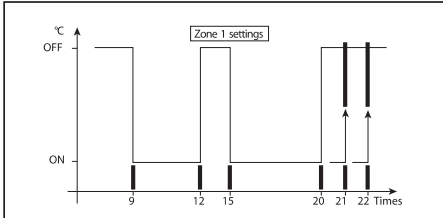
To cancel a sequence press

In-depth programming

Example : In business premises with the following opening hours :

Morning : 9h to 12h - Afternoon : 15h to 20h.

In summer, you wish to maintain the following set temperatures :



It is quite possible to set two time periods with two different set temperatures.

You should proceed as follows to obtain the system operating conditions as shown above :

Press the **PROG** key for 3 seconds to access the timer setting sequences.

Then you have access to the following settings :

Select ZONE 1 by pressing the **▲** UNIT **▼** keys.

Step 1 : **1** ON : 9 h 00 Step 2 : OFF : 12 h 00

Step 3 : **2** ON : 15 h 00 Step 4 : OFF : 20 h 00

Select ZONE 0 by pressing the **▲** UNIT **▼** keys.

Step 5 : **1** ON : :-: OFF : 21 h 00

Step 6 : **2** ON : :-: OFF : 22 h 00

Press the **+** and **-** HOUR keys until the desired time is obtained.

Press the **SET** key to validate each step. You will then move on to the next step.

For Steps 1 and 3, corresponding to a time cycle start point, you will have to set the corresponding set temperature for each mode (cooling and heating, or automatic). To do this, please refer to Page 12 "Setting the desired temperature". You can also initiate programming of start times for unoccupied mode settings.

In fact, if somebody needs to stay on after the normal business closing time (i.e. staying from 20 h to 21 h), they can use the local remote control to set their preferred set temperature. If only one OFF sequence has been programmed (e.g. a global sequence), the last set temperature entered in the system will be the temperature maintained for the rest of the night.

To avoid this happening, you can enter several sequences for moving onto OFF mode, at different times, as illustrated in the above example.

These settings must be set for each Zone and Day in accordance with the desired time periods.

The * Copy/Paste **⌘** key can help you with this task, notably for times that are the same for several days, e.g. weekdays or weekend days.

For example, you just have to enter all the parameters for Monday in Zone 1 and press the * Copy/Paste **⌘** key. Then, the **⌘** symbol appears, indicating that all the settings for the zone and the day of the week are saved in the memory for both the Number 1 and Number 2 timers.

There are several ways of Pasting. You can just paste a day or an entire zone by pressing the same key

In fact, you are copying all the parameters, but for pasting, the parameter flashing in the destination zone is the one that will be saved in memory

For example, if you wish to copy the timer parameters for Monday in Zone 1 to Tuesday in Zone 2 :

First step :

When you are in programming mode, you just have to go to Zone 1 on Tuesday by using the Zone and Day keys.

Second step :

Press the Copy / Paste key Then the **⌘** symbol appears on the display All the parameters of the zone and the day are copied.

Third step :

Use the Zone and Day keys to go to Zone 2 on Tuesday and then press the Copy / Paste key

WARNING : During the third step, you must pay particular attention to the flashing zone In fact, if the ZONE word is flashing, then all the zone programmes for all the days will be copied On the other hand, if as in our example you only wish to copy one day , then the Day and the ON :-: messages should be flashing.

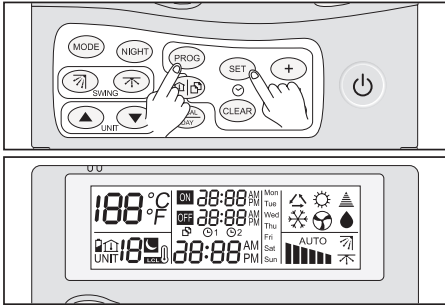
To exit the programming mode, keep pressing the **PROG** key until the programming display disappears and the control mode appears on the screen (2 seconds).

Commissioning the uBMS (initial parameter settings)

Accessing the control unit parameters

WARNING! The procedures described below are only accessible with the control unit ON/OFF control in the OFF position (no temperature displayed on the LCD screen).

Press both the **SET** and **PROG** keys simultaneously for 5 seconds to access the various parameter settings. Stop pressing the keys as soon as the screen turns black (all the symbols are displayed!).



WARNING! If you do not stop pressing the keys When the screen turns black the UBMS control unit moves into re-initialisation mode and all previously stored settings will be lost

Now you have access to the following parameter settings :

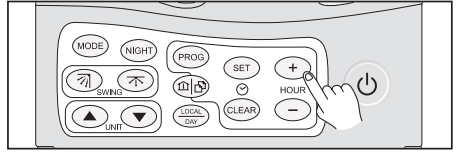
- Time on a 24 hours basis.
- Day of the week,
- Access to timer mode,
- Access to occupied/unoccupied mode,
- Access to air sweep mode,
- Access to audible warnings function,
- Number of zones controlled by the system,
- Type of units controlled by the system,
- Access mode.

You can return to the different settings above by pressing both the **SET** and **PROG** keys simultaneously for 5 seconds.

The timer flashes continuously in parameter setting mode. To exit this mode, you just have to not touch any keys for 20 seconds or press the **SET** key for a few seconds.

Setting the time

To set the time, press the **+** and **-** keys marked HOUR to advance or retard the time.

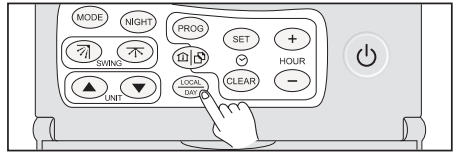


Tip : If you keep pressing on the **+** or **-** key the scrolling speed will increase to make time setting quicker

Time is set on a 24 hours basis.

Setting the day

To set the day of the week, press the **LOCAL ON** to display the corresponding day symbol.



The days of the week are displayed as follows :

- Mon : Monday
- Tue : Tuesday
- Wed : Wednesday
- Thu : Thursday
- Fri : Friday
- Sat : Saturday
- Sun : Sunday

Programming mode accessibility validation

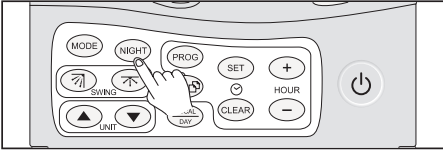
By pressing once, a timer **⌚** 1 symbol appears, a second press makes it disappear


When the **⌚** 1 symbol is displayed, the user has access to the time period programming settings.

Commissioning the uBMS (initial parameter settings)

Night mode

You can also activate or deactivate the night mode by pressing the **NIGHT** Key.




If the  symbol appears, the night mode can be activated. On the other hand, if it is not displayed, the night mode can only be activated after the parameter setting mode has been exited.

This function must not be used on CAC units.

On RAC units, this function enables the night time running function to be activated or deactivated.

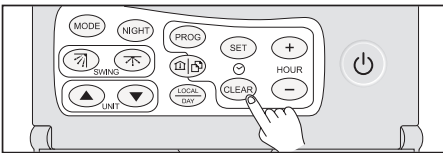
Horizontal air sweep function

Depending on the type of terminal used, you can also activate or deactivate the horizontal air sweep function, via the  key


This function enables a horizontal air sweep louvre motor drive to be activated.

Audible warning function

You can also activate or deactivate the "BIP" by pressing the **CLEAR** key



Each time one of the control unit's keys is pressed this function produces an audible warning sound.



The audible warning function is activated if the  symbol is displayed.

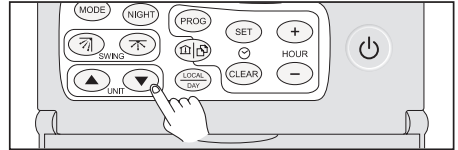
Number of zones and type of unit


These two functions are directly dependent on the installation and its architecture.

In fact, you must determine the number of different zones in your system, i.e. locations with different occupancy and unoccupancy patterns (e.g. office blocks and storage areas) as well as locations with different temperature settings (computer room or offices). You must also determine the type of

associated air conditioning unit, i.e. chilled water or direct expansion terminal.

The number of zones managed by the control unit is defined by using the  and  marked UNIT. The number can be set between 1 and 15 maximum for either increasing or decreasing the number of regulation zones.




Successive presses on the  key set the type of unit, following the sequence below :

00: Residential appliance (direct expansion), 1 set temperature point in AUTO mode.






AU: CAC, 2 set temperature points in AUTO mode.

1 set temperature point in Heating mode.

1 set temperature point in Cooling mode.

Successive presses on the  key set the operating modes accessible by terminal connected to the control unit.



The accessible operating modes are as follows :

Cooling mode	
Heating mode	
Automatic mode	
Ventilation only mode	
Dehumidification mode	

The dehumidification mode is not accessible on CAC units and on certain RAC units, depending on the chosen configuration.

«I Feel» function - Local temperature

This function is only usable when the number of zones is set to 1.

To activate this function, press the  button. The  symbol is displayed.

If the function is activated, the appliance uses the ambient temperature measured by the uBMS control module.

N.B.: If this function is activated in parameter setting mode, the user will not be able to cancel it.

General comments

Back lighting





The liquid crystal display back lighting illuminates when the control unit passes into Configuration / Initialisation mode and when any key is pressed.

The back lighting switches off if no key is pressed within 20 seconds.

Battery

- In the event of 12 V power supply failure, the BATTERY icon is displayed and the POWER luminous diode flashes to indicate that the control unit is running on battery power
- The batteries are rechargeable and therefore do not normally require replacing. However if they do require replacing, use only NIMH 1.2 V rechargeable batteries.
- At the end of their useful life, the batteries should be recovered by an approved waste disposal company, or your supplier
- The uBMS control unit can be operated separately via an independent 12 V, 100mA, D.C. power supply between terminals GND (-) and +12 V (+).




Locking the keypad

The keypad can be locked (with the exception of the software REINITIALISATION keys) by simultaneously pressing the UNIT  and  keys. Then a series of audible warning sounds are emitted and the  Triangle is permanently displayed. Just repeat this operation to unlock the keypad. Then, a different series of audible warning sounds is emitted and the  triangle returns to its normal operating status.


Changing the fan operating mode

Repeatedly press the FAN key or maintain pressure on the key

4 modes are available :

- Low speed ,
- Medium speed ,
- High speed ,
- Auto.

For dual speed CAC and RAC appliances, the uBMS control module provides for a set fan speed. The unit's regulation system manages the fan's operation (ON / OFF) and speed in relation to the set point.

N.B.: In DRY mode, (dehumidification) , the fan will always run in low speed mode and it will not be possible to select any other mode.

For CAC units with a single speed indoor fan, 2 statuses are possible:

- Irrespective of the chosen set speed (Low, Medium, or High), the fan operates continuously (except in OFF mode).
- AUTO: the fan only operates with the demand for Heating or Cooling.

Zone in service (ON)

When a zone is in service, the following information can be displayed :

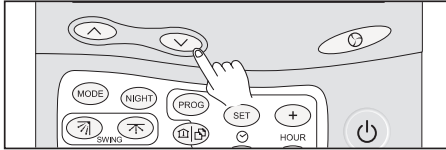
- Time,
- Zone number,
- Ambient temperature or set temperature,
- Fan status,
- Mode and, depending on the configuration, "I Feel" status, night time running status and Louvres status.

The  signal may light up to indicate a message.




General comments

Use of dual set temperature points in AUTO mode




This function is only available if "AU " Mode is selected when the control module's parameters are set.



To adjust the set temperature point in Cooling mode:

Press the  key and then set the desired temperature by pressing the  and  keys. wait until the display returns to "AU " for the set temperature to be stored in the memory

To adjust the set temperature point in Heating mode:

Press the  key and then set the desired temperature by pressing the  and  keys. wait until the display returns to "AU " for the set temperature to be stored in the memory

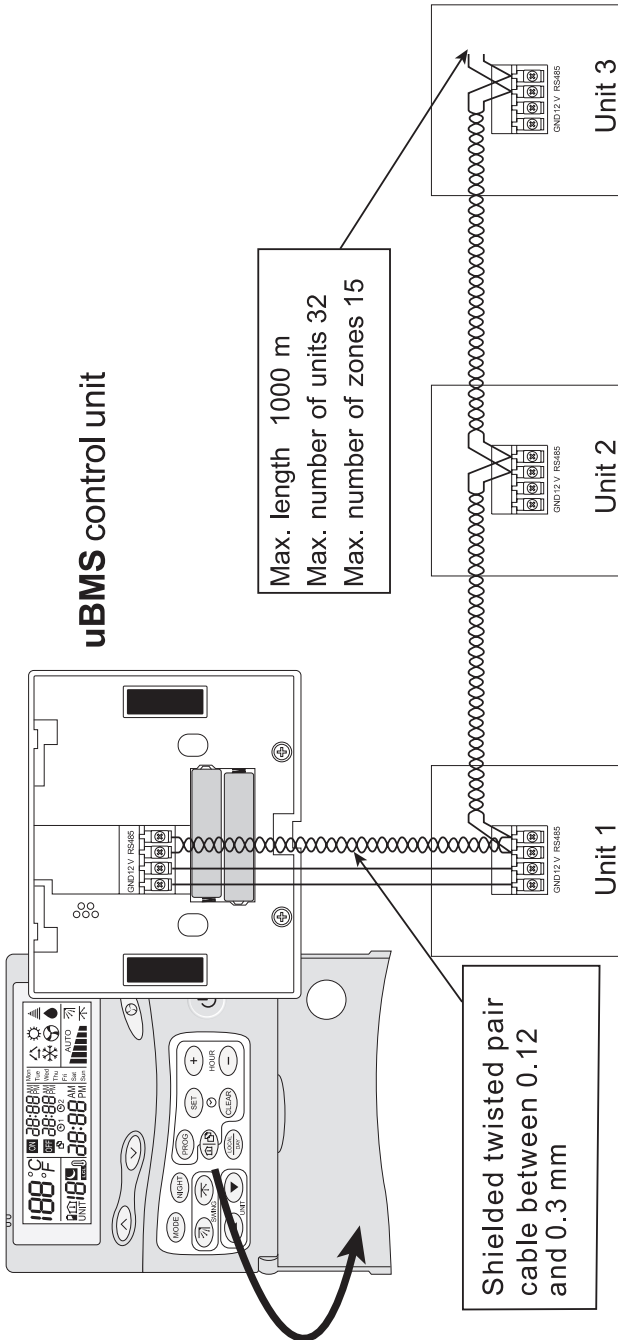
ON/OFF using the all zone command (zone 0)

When the all zone command (Zone 0) is switched ON or OFF, by direct control or by running a programme, the word "SET" appears instead of the time, and messages are sent sequentially to all zones (depending on the configuration), indicating the zone of despatch.

Once this operation is completed, the time and the active zone (0) are again displayed.













During this time (around 1 second per zone), the unit is locked and does not react to user instructions.

This sequential operation avoids simultaneous unit start-ups.



Quick step guide to programming the uBMS to Residential Units

Commissioning the control unit and programming initial parameter settings

- 1/ Wire and connect the uBMS, rechargeable batteries should be left in the unit.
- 2/ The programming of the parameters is only accessible with the uBMS ON/OFF control in the off position (no temperature is displayed on the LCD screen)
- 3/ Press both the  SET and PROG  keys simultaneously for 5 seconds to access the programmable parameters. Stop pressing the keys as soon as the screen background turns black and all symbols are displayed. NOTE:- you are in parameter programmable mode when timer 1 symbol is displayed above the clock time.
- 4/ Press HOUR  or  key to set the time.
- 5/ Press LOCAL / DAY  key to set the day of the week.
- 6/ Press UNIT UP  or Down  key to set the number of units the uBMS is controlling. Eg if the uBMS is controlling two units, unit no 2 will be displayed. So unit 0 being all unit command, unit 1 controlling AC1 and unit 2 controlling AC2.
- 7/ Whilst individual units are displayed in parameter mode you program the type of unit by pressing the LEFT LOUVRE SWING  key. Program the display to read "00" for residential units. Residential units have 1 temperature set point and suit the storm and general purpose PCB's.
- 8/ If you require controlling the room temperature from the internal sensor in the uBMS instead of the room air sensor located in the return air of the indoor unit you must program the "I FEEL" function to the uBMS by displaying the LCL  symbol. To activate this function press the COPY / PASTE  key so the LCL  symbol is displayed. This function is only usable when the number of units is programmed to 1.
- 9/ To exit the parameter programming mode press the set  key for a few seconds. The clock display will stop flashing and the timer symbol will disappear. The uBMS is now configured to look for the required number of units programmed in the field.
- 10/ Note:- If you do not touch any keys for a period of 20 seconds the uBMS will disconnect you from the parameter programming mode.

Configuring the uBMS to the air conditioning units

- 1/ The uBMS controller now requires the address to be configured to the air conditioning units and retained in the memory.
- 2/ Select unit 1 on the uBMS and proceed to nominated unit 1.
- 3/ Residential units require the MODE button to be pressed on the air conditioning unit (not the uBMS) for 5 seconds until 3 beeps are heard, this button is located on the unit fascia on hi-wall, cassettes, and console units, for ducted units this button is located on the infra red receiver casing. (if the receiver is not fitted to the PCB the 8mtr cable and remote receiver will have to be temporarily connected as the mode button is on the receiver).
- 4/ Press the ON / OFF key on the uBMS twice to save. The air conditioner is now configured to unit 1 on the uBMS and the address is now saved in the memory. Unit 1 can now be left on.
- 5/ Follow the same procedural steps for unit 2, 3, etc.

Quick step guide to programming the uBMS to Commercial Units

Commissioning the control unit and programming initial parameter settings

- 1/ Wire and connect the uBMS, rechargeable batteries should be left in the unit.
- 2/ The programming of the parameters is only accessible with the uBMS on/off control in the off position (no temperature is displayed on the LCD screen)
- 3/ Press both the **SET** (SET) and **PROG** (PRG) keys simultaneously for 5 seconds to access the programmable parameters. Stop pressing the keys as soon as the screen background turns black and all symbols are displayed. NOTE:- you are in parameter programmable mode when timer 1 symbol is displayed above the clock time.
- 4/ Press **HOUR** (+) or (-) key to set the time.
- 5/ Press **LOCAL / DAY** (LOCAL SWY) key to set the day of the week.
- 6/ Press **UNIT UP** (▲) or **Down** (▼) key to set the number of units the uBMS is controlling. Eg if the uBMS is controlling two units, unit no 2 will be displayed. So unit 0 being all unit command, unit 1 controlling AC1 and unit 2 controlling AC2.
- 7/ Whilst individual units are displayed in parameter mode you program the type of unit by pressing the **LEFT LOUVRE SWING** (🌀) key. Program the display to read "AU" for commercial units. Commercial units have 2 temperature set points in auto mode for heating and cooling and suit the CAC PCB's (if you require 1 temperature set point, program the display to read "00").
- 8/ If the system requires controlling the room temperature from the internal sensor in the uBMS instead of the room air sensor located in the return air of the indoor unit you must program the "I FEEL" function to the uBMS by displaying the **LCL** (🌡️) symbol. To activate this function press the **COPY / PASTE** (📄) key so the **LCL** (🌡️) symbol is displayed. This function is only usable when the number of units is programmed to 1.
- 9/ Commercial unit addressing is configured via the DIP switches S9, S10, S11 and S12 on the CAC PCB located in the air conditioning unit. Refer to the following chart for the addresses. The combination of the DIP switches on the CAC PCB enable that addresses between 1 and 15 to be obtained. The address chosen for the CAC PCB corresponds to the unit number on the uBMS controller.

Address	DIP Switch S9	DIP Switch S10	DIP Switch S11	DIP Switch S12
Unit 0	Off	Off	Off	Off
Unit 1	On	Off	Off	Off
Unit 2	Off	On	Off	Off
Unit 3	On	On	Off	Off
Unit 4	Off	Off	On	Off
Unit 5	On	Off	On	Off
Unit 6	Off	On	On	Off
Unit 7	On	On	On	Off
Unit 8	Off	Off	Off	On
Unit 9	On	Off	Off	On
Unit 10	Off	On	Off	On
Unit 11	On	On	Off	On
Unit 12	Off	Off	On	On
Unit 13	On	On	On	On
Unit 14	Off	On	On	On
Unit 15	On	On	On	On

- 10/ The CAC PCB will now require a control reset by simultaneously pushing keys SW1 and SW2 on the PCB until CRUN appears on the LCD screen. Now the outdoor PCB recognizes that the uBMS is the units controller. If the CAC PCB shows an rt alarm refer to step 8 and programme the local symbol to the uBMS. (Refer to the CAC operational and technical manuals for CAC PCB control and fault logic or phone Technical Support on 1800 1800 04).

