M500-Master

Owner's Manual – Installation and Operating Instructions

⚠ **Please read this manual carefully before installation and use.**

Index

1. Installation Instructions

Mounting the Master

Do not install the master in a draft, near a floor/ wall/ roof register. Consideration also needs to be given to drafts that may be present near externally opening doors, chillers or windows.
Where possible mount the master out of direct sunlight and on internal walls.

Further, when mounting the master be aware of drafts that may travel down the inside of walls, (especially if mounted on external walls).

It is recommended to mount the master between 1.5 & 1.8 meters from the floor where possible.

1.1   Separate the base from the cover by pressing the tongue (pic.1).

1.2   Gently disconnect the cover from the base with quick connector (pic.2)

1.3   Line the back panel up against the wall or flat surface on which it is to be mounted and drill the appropriate fixing holes (pic.3).

1.4   Insert screws so they extend approx. 3/16" (3 mm) from wall or surface.

1.5   Align the back panel against these screws, pushing it forward, allowing it to slide downwards to lock into position.

1.6   Make electrical connections to terminals on the back panel as shown on enclosed electrical wiring diagram.

1.7   Reconnect the quick connector.

1.8   Adopt the cover to the base, first the two shafts and than the spring.

1.9   Connect 12Vdc/24Vac to the master, verify that LCD display is ON.

1.10 Turn of the power to the master, wait 10 seconds and reconnect the power to confirm that the master retains memory.

Pic.1

Pic.2

Pic.3
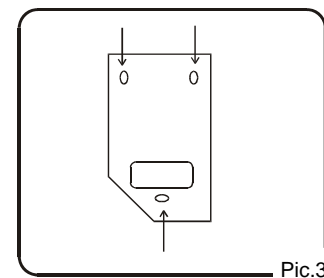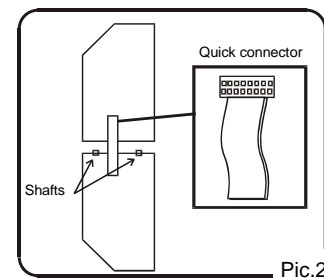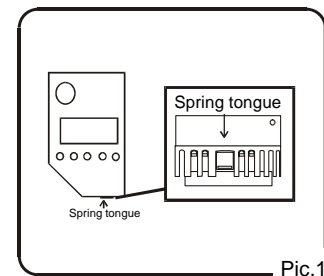
2. Wiring Connections

2.1 Connections Table.

Switch	Function
+12VDC	Supply 12Vdc/24Vac (see Jumper 4 explanation in #3)
0	Supply 12Vdc/24Vac (see Jumper 4 explanation in #3)
TxD	Not in use
RxD	Not in use
A1	Not in use
B1	Not in use
A2	RS485 communication for thermostats and PS
B2	RS485 communication for thermostats and PS

3. Hardware Jumpers

⚠️ **Important - before making any changes in the hardware jumpers, disconnect electricity power on the main switch.**

Back of the thermostat

JMP1

NOT IN USE

JMP2

RS485 To thermostats

JP4

Input 1/24Vac
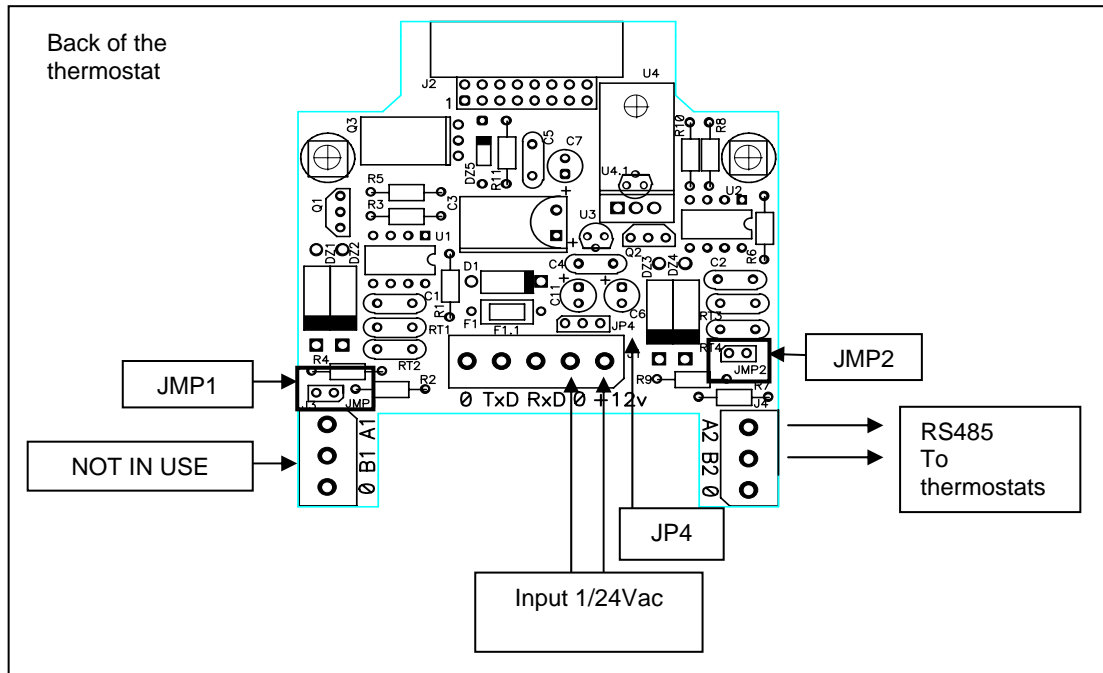
JMP1, JMP2: (Leave Open – default from factory)

JMP4: 12Vdc: JMP4   24Vac: JMP4

To change JMP4 - 12Vdc or 24Vac

- Turn power off.
- Change the position of the jumper (A or B) as shown above.
- Turn power on.

4. DIP Switch Configuration

⚠️ **Do not make any changes to the DIP switch before turning the unit off and disconnecting power.**

Switch	Function	Pos.	Def.
1	Clock mode – 12 hours (AM/PM)	ON	
	Clock mode – 24 hours	OFF	X
2	Temperature Scale: ºF	ON	
	Temperature Scale: ºC	OFF	X
3-8	Not in Use (OFF position)		

5.1 Master Front

SET

ON
— On/Off

TX2 RX2
— Network communication receiver
— Network communication transmitter

TX1 RX1
— Not in use
— Not in use

Selecting single device

Adjustments (temp. etc,)

ON/OFF
— Turning device on/off

SET CLOCK TEMP

HEAT
COOL

MON TUE WED THU FRI SAT SUN ┌ PROGRAM ┐
START ○   └ 1 2 3 4 ┘

Changing device
Set temperature and
Set temperature limit

Weekly program

SELECT   VIEW   EC   RESET   SEND

— View device setting

— Sending device setting

— Selecting all devices

PROG   CLOCK   MODE   AUTO   DEVICE
                          FAN

Setting Master real
time clock and day

Auto Fan / Faults Reset

View T2, T3, Faults,
Dampers status, Pressure

System mode: cool / Heat / auto change-over / fan only
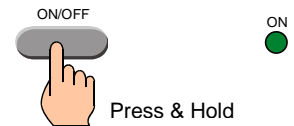Unoccupied Mode – set back mode (Economy)

5.2 Settings

- 5.2.1 – ON/OFF
- 5.2.2 - System Modes (COOL / HEAT / AUTO CHANGE-OVER / FAN ONLY)
- 5.2.3 - Fan Mode (FAN ON or AUTO FAN)
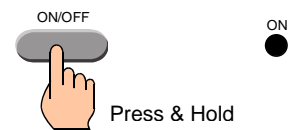- 5.2.4 - Unoccupied Mode (Set back mode)

5.2.1 On/Off

Turn all the zones on or off

- Press the ON/OFF button to turn the system on.
  All the zones turn on.
 The green led "ON" will turn on.

- Press and hold (2 seconds) the ON/OFF button
  to turn the system off.
  All the zones turn off.
  The green led "ON" will turn off.

Turn one zone on or off

- Press the SEND/DEVICE button – "dALL" or "d00#" appears on display.

- Using the (+) or (-) button select one of the zones (d001, d002 etc.).

- If there is no zone applying to the chosen number, "E000" will appear on display.

- Press and hold the SEND/DEVICE button – ambient temperature and set

  temperature of the selected zone will appear on display.

- Press the ON/OFF button to turn the zone ON or OFF – notice the green led that

  indicates the current status of the zone: Led on – zone on, Led off – zone off.

- Press and hold the SEND/DEVICE button to send information to the zone.

- Press the SEND/DEVICE button twice or wait to return to normal mode.
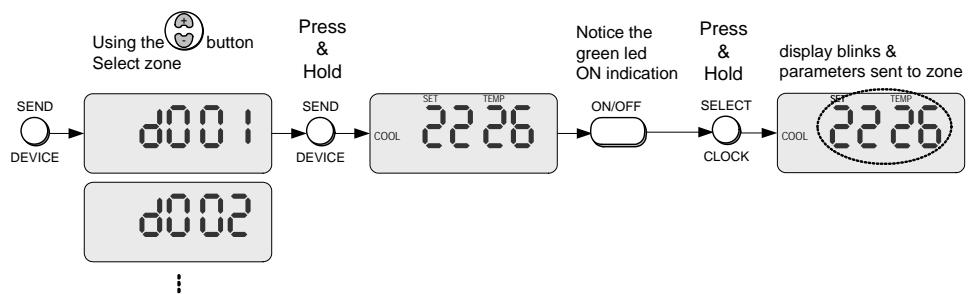
5.2.2 System Modes

The MODE button defines mode for the system and only selected at the master.

- Press the MODE button to switch between the four modes:

  a. **COOL** - Cooling mode.
     "Cool" appears on display.

  b. **HEAT** - Heating mode
     "Heat" appears on display.

  c. **COOL/HEAT** - Activate Heating and Cooling automatically according
     to the difference between the "Set" and "Actual" temperature. "Cool"
     and "Heat" appear on display".

  d. **FAN ONLY** - When only ventilation is needed.
     Neither "cool" or "heat" appear on display.

     In FAN ONLY – depending on the zone's ON/OFF status:
     - Zone ON   →   Damper fully open
     - Zone OFF   →   OFF (Damper fully close)
     - The fan will work.

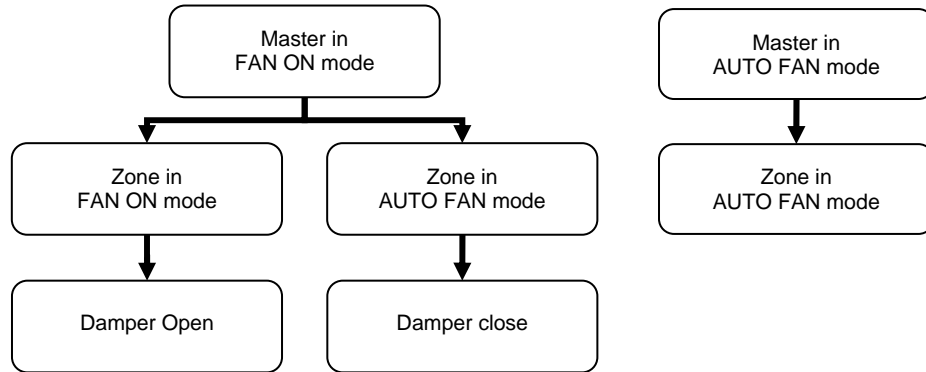| | | Auto | |
| Cool | Heat | change-over | Fan only |
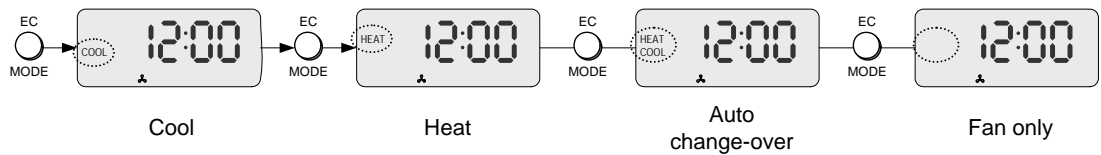
5.2.3 Fan mode (FAN ON / AUTO FAN)

The FAN ON/AUTO FAN function is available through the master and through the zones, **however** they differ from each other, as explained below:

The system will perform as follows:

a. When there is no current demand for cooling or heating by any zone:

b. When there is demand for cooling or heating by one or more zones:
The dampers of a zone will open or close depending on the cooling or heating demand of that particular zone.

Change fan mode of all the zones via the master.

- Press the AUTO FAN button to switch between:

    a. **FAN ON** – Option at the zone to select FAN ON/AUTO FAN.

       Switch the M500 to FAN ON mode - The fan mode of each zone is set by the zone itself and will not be changed automatically.

    b. **AUTO FAN** – The zone will be in AUTO FAN mode all the time.

       Switch the M500 to AUTO FAN mode – all the zones turn into AUTO FAN mode. This mode cannot be override from the zone.
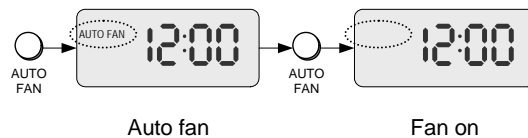

Auto fan   Fan on

Important: In HC – Gas/Oil mode:

When AUTO FAN is on   →   the fan will **never** turn on

When FAN ON is on   →   the fan will **always** be on

Change fan mode of a single zone via the master.

- Press the SEND/DEVICE button – "dALL" or "d00#" appears on display.

- Using the (+) or (-) button select one of the zones (d001, d002 etc.).

- If there is no zone applying to the chosen number, "E000" will appear on display.

- Press and hold the SEND/DEVICE button – room temperature and set

  temperature of the selected zone will appear on display.

- Press the AUTO FAN button to switch between fan and auto fan modes.

- Press and hold the SEND/DEVICE button to send parameters to the zone –

  the display will flash.

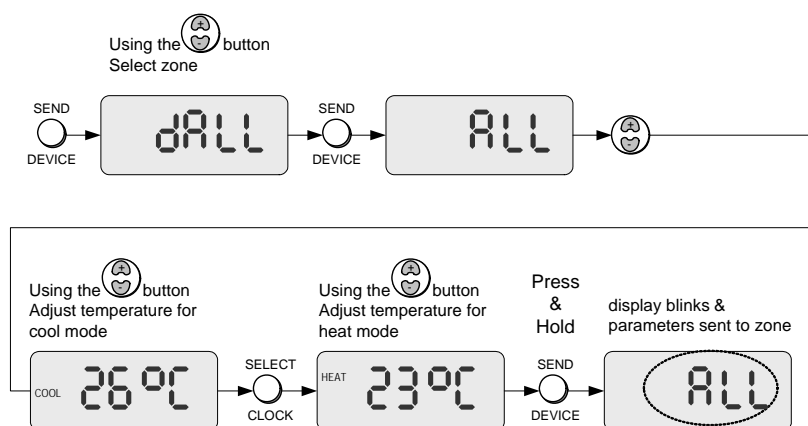- Wait until display returns to normal mode.
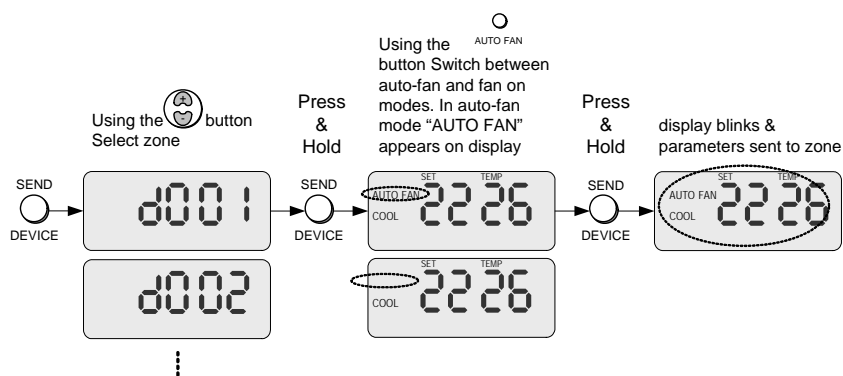
5.2.4 Set Temperature Of A Single Zone

- Press the SEND/DEVICE button – "dALL" or "d00#" appears on display.

- Using the (+) or (-) button select one of the zones (d001, d002 etc.).

- If there is no zone applying to the chosen number, "E000" will appear on display.

- Press and hold the SEND/DEVICE button – ambient temperature, set temperature and current active mode of the selected zone will appear on display.

- Using the MODE button select cooling mode - "COOL" and the current set temperature for cooling will appear on display.

- Using the (+) and (-) buttons – adjust the set temperature for cooling for the zone.

- Press the MODE button select heating mode – "HEAT" and the current set temperature for heating will appear on display.

- Using the (+) and (-) buttons – adjust the set temperature for heating for the zones.

- Press and hold the SEND/DEVICE button to send parameters to the zone – the display will flash.

- Press the SEND/DEVICE button twice or wait to return to normal mode.
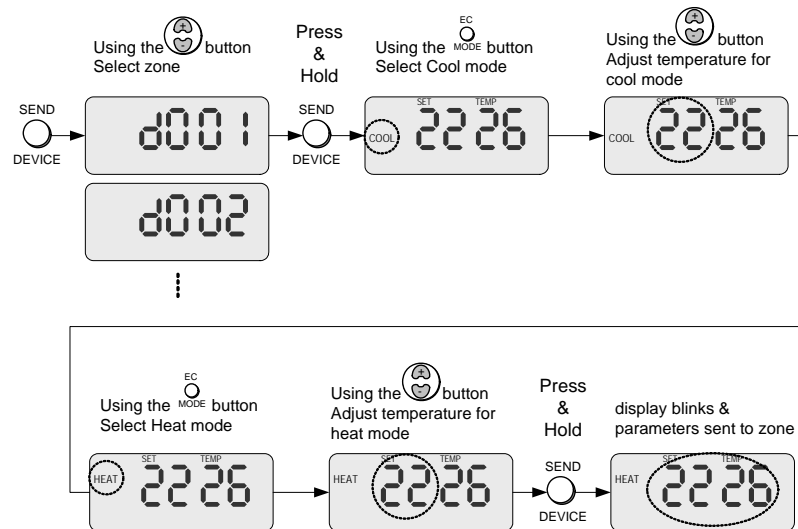
5.2.5 Set Temperature Of All The Zones Simultaneously

- Press the SEND/DEVICE button – "dALL" or "d00#" appears on display.

- Using the (+) or (-) button, select all the zones (dALL).

- Press and hold the SEND/DEVICE button – "ALL" appears on display.

- Press the (+) or (-) buttons – "COOL" and the current set temperature for cooling will appear on display.

- Using the (+) and (-) buttons – adjust the set temperature for cooling for the zones.

- Press the SELECT/CLOCK button – "HEAT" and the current set temperature for heating will appear on display.

- Using the (+) and (-) buttons – adjust the set temperature for heating for the zones.

- Press and hold the SEND/DEVICE button to send parameters to the zones – "ALL" will flash on display.

- Press the SEND/DEVICE button twice to return to normal mode.

The set temperature for cooling is always higher than the set temperature for heating. The controller will automatically adjust the temperatures to fit this condition

**In Fan only mode, the set temperature is the set cool temperature.**

5.2.6 Set Temperature Limits Of A Single Zone

- Press the SEND/DEVICE button – "dALL" or "d00#" appears on display.

- Using the (+) or (-) button select one of the zones (d001, d002 etc.).

- If there is no zone applying to the chosen number, "E000" will appear on display.

- Press and hold the SEND/DEVICE button – ambient temperature and set temperature of the selected zone will appear on display.

- Press the SELECT/CLOCK button – "C50" will appear on display.

- Using the (+) button change the number (code) to "C55".

- Press the SELECT/CLOCK button – "LC ##" will appear on display. (## - the current zone's temperature limit for cooling).

- Using the (+) and (-) buttons adjust the zone's temperature limit for cooling.

- Press the SELECT/CLOCK button – "LH ##" will appear on display. (## - the current zone's temperature limit for heating).

- Using the (+) and (-) buttons adjust the zone's temperature limit for cooling.

- Press and hold the SEND/DEVICE button to send parameters to the zone – the display will flash.

- Wait until display returns to normal mode.
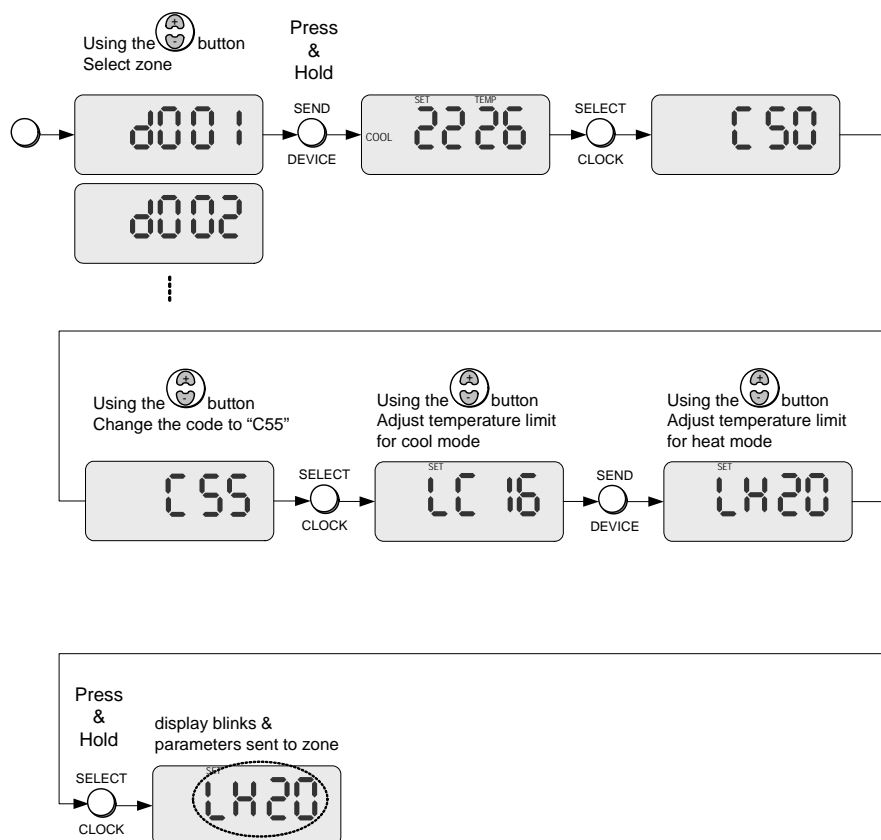
5.2.7 Set Temperature Limits For All The Zones Simultaneously

- Press the SEND/DEVICE button – "dALL" or "d00#" appears on display.

- Using the (+) or (-) button, select all the zones (dALL).

- Press and hold the SEND/DEVICE button – "ALL" will appear on display.

- Press the SELECT/CLOCK button – "C50" will appear on display.

- Using the (+) button change the number (code) to "C55".

- Press the SELECT/CLOCK button – "LC ##" will appear on display.

- Using the (+) and (-) buttons adjust the temperature limit for cooling.

- Press the SELECT/CLOCK button again – "LH ##" will appear on display.

- Using the (+) and (-) buttons adjust the temperature limit for heating.

- Press and hold the SEND/DEVICE button to send parameters to the zones – "ALL" will flash on display.

- Press the SEND/DEVICE button twice or wait to return to normal mode.
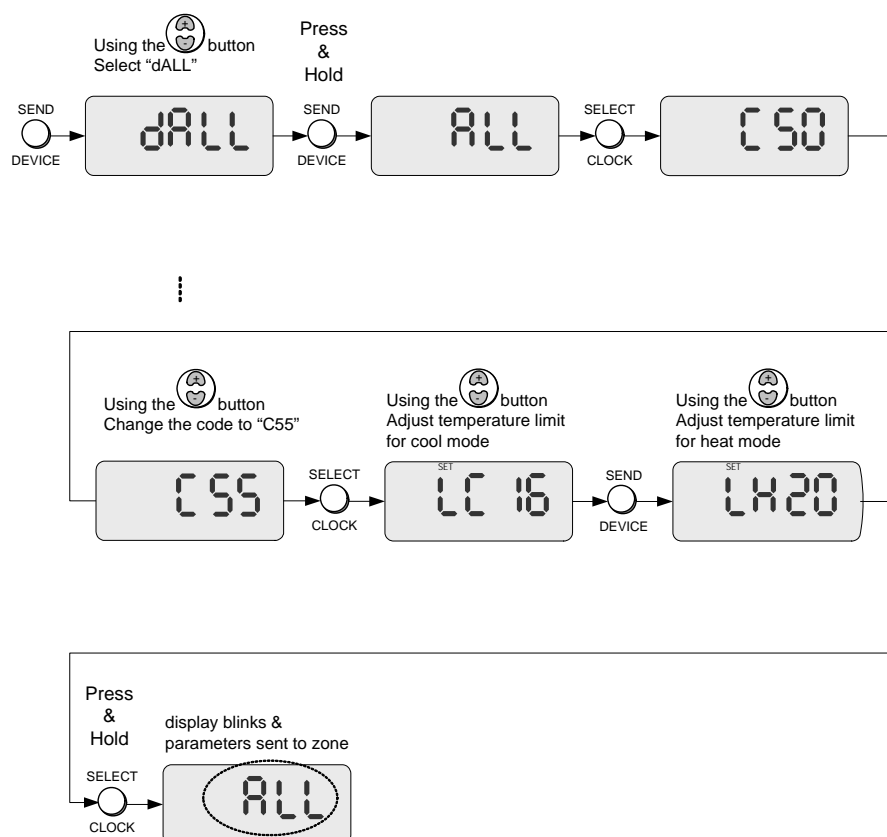
5.2.8 Unoccupied Mode (Set Back Mode) - EC

Unoccupied mode overrides the set point temperature and uses set economy temperatures for heat and cool.

Once the system enters economy mode and until this mode is cancelled, no changes can be made by the zones.

Set the system to work in Unoccupied Mode.

- Press and hold the EC/MODE button (20 seconds) until the master beeps and 'EC' (Economy) appears on display.

- Press and hold the EC/MODE button again (20 seconds) until the master beeps and 'EC' (Economy) disappears on display.
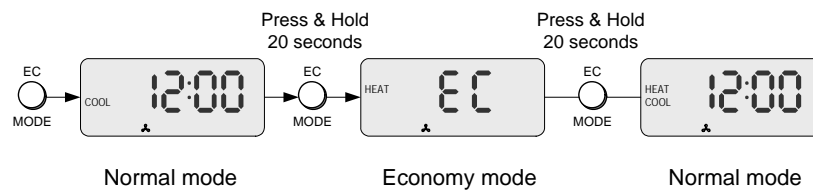

When the system is in unoccupied mode – the display of the master will alternate between real time clock and "EC".

The display of the zones will alternate between ambient temperature and "EC".

5.3 Real Time Clock And Day

To set the system clock:

- Adjust the hours: Press the SELECT/CLOCK button - the hours will flash.

- Using the (+) and (-) buttons set the hours.

- Adjust the hours: Press the SELECT/CLOCK button - the minutes will flash.

- Using the (+) and (-) buttons set the minutes.

- Adjust the day of the week: Press the SELECT/CLOC K button - the day of the week will flash.

- Using the (+) and (-) buttons set the day of the week.

- Press the SELECT/CLOCK button again to return to normal display.
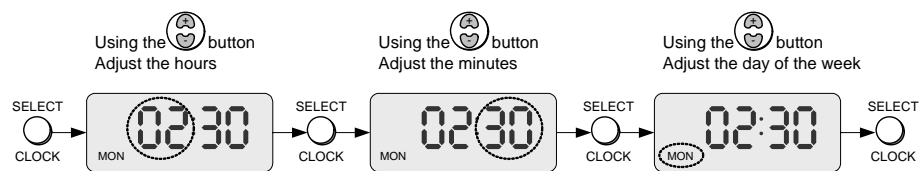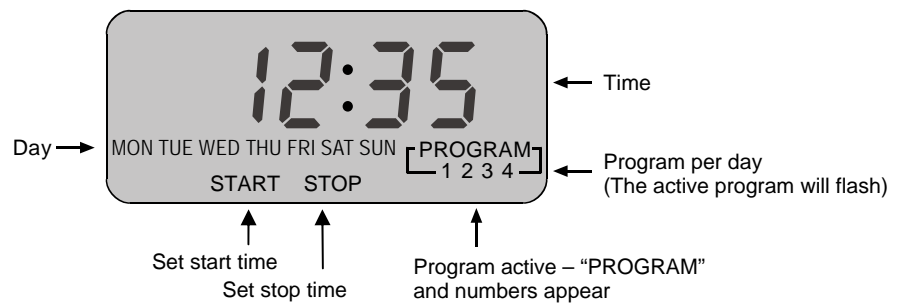
5.4 Weekly Program

5.4.1 General

The weekly program allows you to set different programs for each day of the
week and for each day 4 programs.
Adjustable start time and stop time for each of the programs.

Order of program settings:

1.	Monday	- Program 1	- Start time , Stop time
2.	Monday	- Program 2	- Start time , Stop time
3.	Monday	- Program 3	- Start time , Stop time
4.	Monday	- Program 4	- Start time , Stop time
5.	Tuesday	- Program 1	- Start time , Stop time
6.	Tuesday	- Program 2	- Start time , Stop time
28.	Sunday	- Program 4	- Start time , Stop time

Program display:

It is recommended to plan and write down the different programs prior to setting the program by the master.
The following table can be used for pre editing the weekly program.

|	Program 1		Program 2		Program 3		Program 4	
	Start	Stop	Start	Stop	Start	Stop	Start	Stop
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								
Sunday								

5.4.2 Set The Program

Monday, Program 1, Start time:

- Press the PROG button – "**START**", "**MON**" and "**PROGRAM 1**" appear on display. The **hours** will flash.
- Adjust the hours using the (+) and (-) buttons
- Press the PROG button again – "**START**", "**MON**" and "**PROGRAM 1**" appear on display. The **minutes** will flash.
- Adjust the minutes using the (+) and (-) buttons
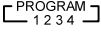
Monday, Program 1, Stop time:

- Press the PROG button – "**STOP**", "**MON**" and "**PROGRAM 1**" appear on display. The **hours** will flash.
- Adjust the hours using the (+) and (-) buttons
- Press the PROG button again – "**STOP**", "**MON**" and "**PROGRAM 1**" appear on display. The **minutes** will flash.
- Adjust the minutes using the (+) and (-) buttons

- **Repeat the steps above for each of the 4 programs for Monday.**
- **Repeat the steps above for the other days: Tue, Wed, Thu, Fri, Sat, Sun.**
- **You can review the program or change part of it by entering program mode and pressing the PROG button until reaching the desired program.**
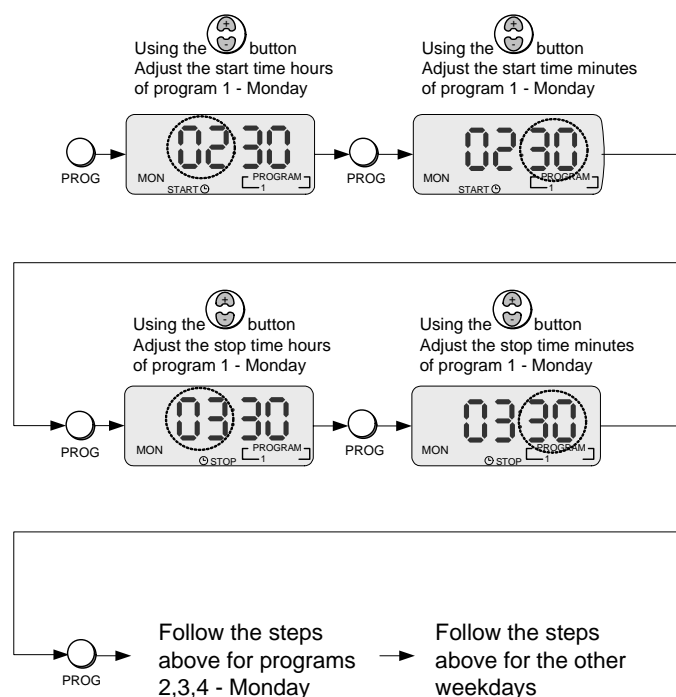
5.4.3 Activate Or Deactivate The Program

The ⌐PROGRAM 1234⌐ sign at the bottom right corner of the display indicates weather the program is currently active or not.
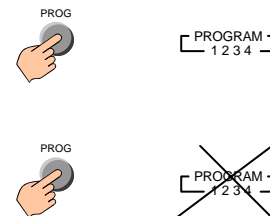
Sign on – the program is active.
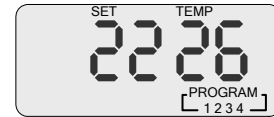
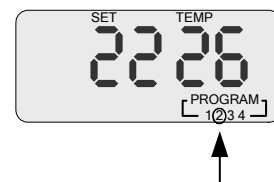Sign off – the program is not active.

Activate or deactivate the program:

- Press and hold the PROG button to activate the program.

- Press and hold the PROG button again to deactivate the program.

<u>Important</u>: **The number indicating the current active program will flash.**

6.1 Bypass Damper Settings

The Bypass damper can be set to work in the following modes:
- Open/Close according to the pressure measured in the duct.
- Open/Close according to the status of the dampers of the zones (open percentage).

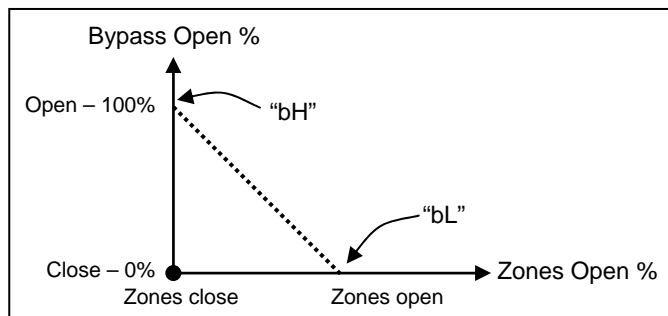For each of these methods, the following parameters must be set:
- "bL" – Bypass low limit (the point when the bypass damper start opening).
- "bH" – Bypass high limit (the point when the bypass is fully open).
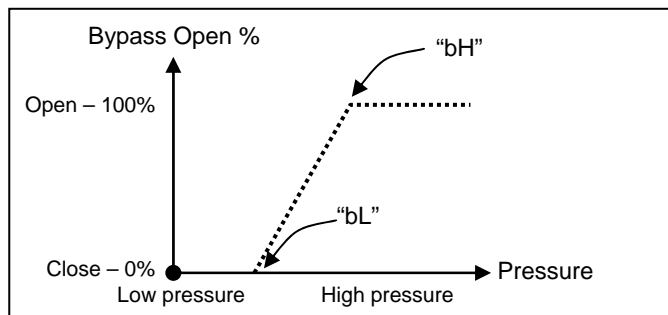
Explain:
Low pressure in the duct = Bypass close.
High pressure in the duct = Bypass open.

Explain:
Zones dampers close = Bypass open
Zones dampers open = Bypass close

- When the bypass damper opens according to pressure in the duct:

    "bL" – the low pressure that forces the bypass damper to start opening.

    "bH" – the high pressure that forces the bypass damper to be fully open

    In this case: "bL" is lower than "bH".

    Example:

    The bypass will start opening when the pressure in the duct reaches 60% ("bL"=60).

    The bypass will be fully open when the pressure in the duct reaches 80% ("bL"=80).

- When the bypass damper opens according to the status of the dampers of the zones
(open percentage):

    "bL" – the total open percentage of dampers that forces the bypass damper to start opening.

    "bH" – the total open percentage of dampers that forces the bypass damper to be fully open

    In this case: "bL" is higher than "bH".

    Example:

    The bypass will start opening when the dampers are 40% open ("bL"=40).

    The bypass will be fully open when the dampers are 20% open ("bH"=20).

Changing "bL" and "bH":

- Press the SEND/DEVICE button – "dALL" or "d00#" appears on display.

- Press the (-) button until "SEtS" appears on display.

- Press and hold the SEND/DEVICE button – "n250" (or similar) appears on display.

- Press the SEND/DEVICE button again – "bP ##" appears on display.

- Using the (+) and (-) buttons switch between:

  - 01 – By pressure in the duct

  - 02 – By damper's open percentage

- Press the SEND/DEVICE button again – "bL ##" appears on display.

- Using the (+) and (-) buttons adjust the lower point – the point when the bypass start opening.

- Press the SEND/DEVICE button again – "bH ##" appears on display.

- Using the (+) and (-) buttons adjust the higher point – the point when the bypass is fully open.

- Press and hold the SEND/DEVICE button to send parameters.

- Wait until display returns to normal mode.
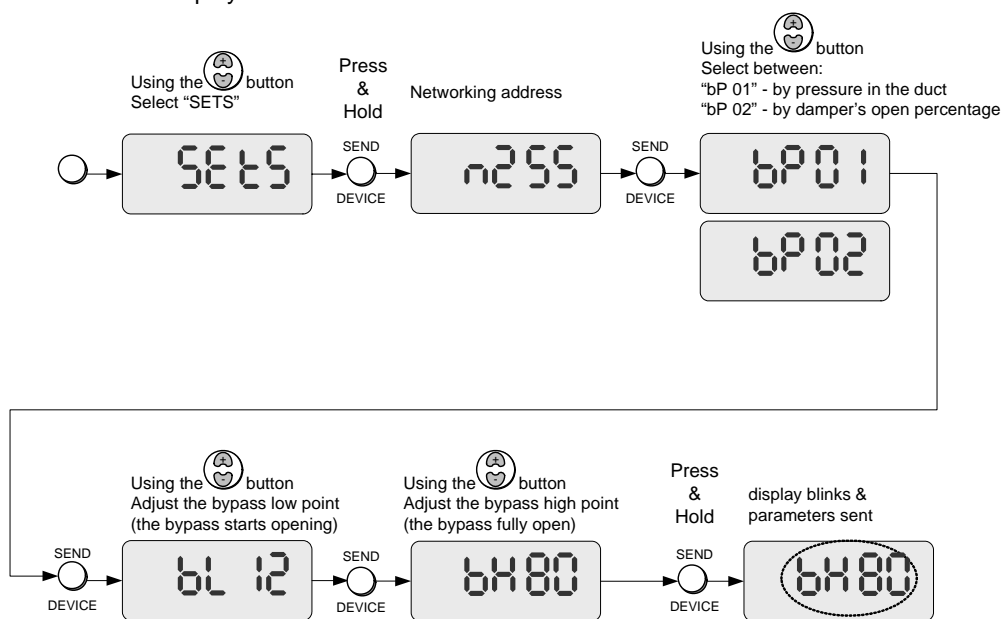
6.2 Networking Address (For Future Use)

The Networking Address, uniquely identify the current system in a
communication network, i.e. MaxiNet system – thermostat network.
(Range 0-255)

Leave it "n255" !

To view the networking address:

- Press the SEND/DEVICE button – "dALL" or "d00#" appears on display.

- Press the (-) button until "SEtS" appears on display.

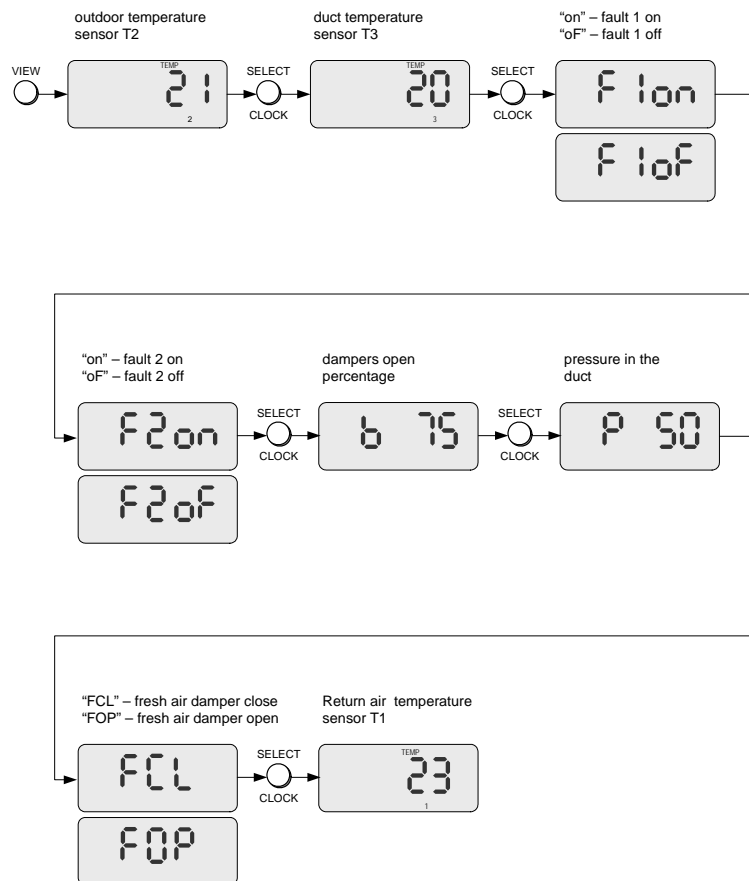- Press and hold the SEND/DEVICE button – "n255" appears on display.
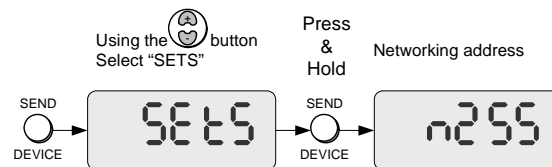
6.3 View System Parameters – Main Board

The following system parameters can be viewed through the master:

▪ T2 – Outdoor temperature

▪ T3 – Duct temperature

▪ Fault 1 status

▪ Fault 2 status

▪ Dampers open percentage - total

▪ Pressure in the duct – range 0÷100%

▪ Fresh air damper status – range 0÷100%

▪ T1 – Return air temperature

To view the system parameters:

▪ Press and hold the VIEW button – "TEMP ##" and "2" appear on display

  (## - outdoor temperature – sensor T2).

  If the T2 sensor is not connected, "- -" will appear on display.

▪ Press the SELECT/CLOCK button - "TEMP ##" and "3" appear on display

  (## - duct temperature – sensor T3).

  If the T3 sensor is not connected, "- -" will appear on display.

▪ Press the SELECT/CLOCK button - "F1 on" or "F1 oF" appear on display

  ("on" – fault 1 on, "oF" – fault 1 off).

▪ Press the SELECT/CLOCK button - "F2 on" or "F2 oF" appear on display

  ("on" – fault 2 on, "oF" – fault 2 off).

▪ Press the SELECT/CLOCK button - "b ##" appears on display

  (## - dampers open percentage).

▪ Press the SELECT/CLOCK button - "P ##" appears on display

  (## - pressure in the duct).

▪ Press the SELECT/CLOCK button - "FCL" or "FOP" appears on display

  ("FCL" – fresh air damper close, "FOP" – fresh air damper open).

▪ Press the SELECT/CLOCK button - "TEMP ##" and "1" appear on display

  (## - return air temperature – sensor T1).

  If the T1 sensor is not connected, "- -" will appear on display.

▪ Press the SELECT/CLOCK button again to repeat the cycle or wait until display returns to

  normal mode.

outdoor temperature
sensor T2

duct temperature
sensor T3

"on" – fault 1 on
"oF" – fault 1 off

VIEW ○ → [TEMP **21** 2] → SELECT ○ CLOCK → [TEMP **20** 3] → SELECT ○ CLOCK → [**F1on**]

[**F1oF**]

"on" – fault 2 on
"oF" – fault 2 off

dampers open
percentage

pressure in the
duct

→ [**F2on**] → SELECT ○ CLOCK → [**b 75**] → SELECT ○ CLOCK → [**P 50**]

[**F2oF**]

"FCL" – fresh air damper close
"FOP" – fresh air damper open

Return air temperature
sensor T1

→ [**FCL**] → SELECT ○ CLOCK → [TEMP **23** 1]

[**FOP**]

23

6.4 View Zone Parameters

The following zone parameters can be viewed through the master:

- Temperature limit for cooling
- Temperature limit for heating
- The damper's open percentage

To view the system parameters:

- Press the SEND/DEVICE button – "dALL" or "d00#" appears on display.
- Using the (+) or (-) button select one of the zones (d001, d002 etc.).
- If there is no zone applying to the chosen number, "E000" will appear on display.
- Press and hold the SEND/DEVICE button – ambient temperature and set temperature of the selected zone will appear on display.
- Press the SELECT/CLOCK button – "C50" will appear on display.
- Using the (+) button change the number (code) to "C55".
- Press the SELECT/CLOCK button – "LC ##" will appear on display. (## - the current zone's temperature limit for cooling).
- Press the SELECT/CLOCK button – "LH ##" will appear on display. (## - the current zone's temperature limit for heating).
- Press the SELECT/CLOCK button – "COOL", "HEAT" and "##" will appear on display. (## - the zone's damper open percentage).
  An "I" sign will appear next to the active mode.
- Press the SELECT/CLOCK button again to repeat the cycle or wait until display returns to normal mode.
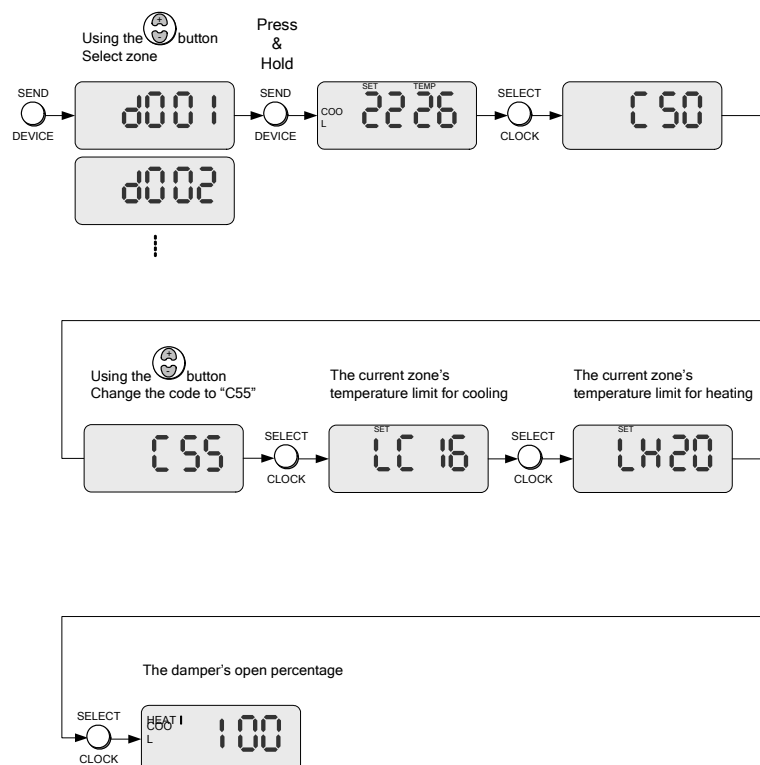
6.5 Faults

6.5.1 General

The system supports 2 normally open contacts used to indicate system faults.
See connection of fault inputs on the PSMZ502 connection sheet.

The Master enables the administrator to view the status of each of the faults.

Fault 1 ON – The system will automatically shut down and indication will
appear on the master's display.

Fault 2 ON – The system keeps working as usual and indication will appear
on the master's display.

6.5.2 Fault Indication

When fault 1 is active – the display will alternate between real
time clock and "FLt1"

FL t 1
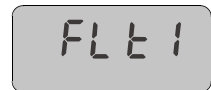
When fault 2 is active – the display will alternate between real
time clock and "FLt2"

FL t2

6.5.3 Reset The Fault (When Connected In The Main Board)

In order to reset the fault alert:

- Call technician and fix the fault.

- Reset the unit – Press and hold the RESET/AUTO FAN button until the
indication disappears from the display.

6.6 Fresh Air Damper

In the main board, there is an option to connect a fresh air damper,

24Vac – See connection table in #3

The are 2 logics to set the activate the fresh air damper,

6.6.1 Logic 1 – By Temperature

For this application you need to connect 2 temperature sensors in the main board:

- T1 – room temperature sensor – senses the temperature in the main space.
- T2 – outdoor temperature sensor – senses the outdoor temperature.

The differential between the room temperature and the outdoor temperature that will open
or close the fresh air damper is factory set and cannot be set by the technician.
This differential is the same for COOL and HEAT.

In COOL mode: The Fresh Air Damper will only open when the T2 is lower than T1, by
more than the differential.

In HEAT mode: The Fresh Air Damper will only open when the T2 is higher than T1, by
more than the differential.

6.6.2 Logic 2 – By Time

You can set the fresh air damper to open for a certain amount of minutes every ½ hour.

Example: if the master is set to open the Fresh Air Damper for 5 minutes, the damper will
open for 5 minutes, close for 25 minutes, open for 5 minutes, close for 25 minutes and so
on and so forth.

In order to set the damper's open time follow these steps:

- Press the SEND/DEVICE button – "dALL" or "d00#" appears on display.
- Using the (-) button select "SEtS".
- Press and hold the SEND/DEVICE button – "n###" appears on display.
- Press the SEND/DEVICE button 4 more times until "Fd ##" appears on display.
- Using the "+" and "-" button adjust the amount of minutes for he damper's open time.
- Press and hold the SEND/DEVICE button to send parameters.
- Wait until display returns to normal mode.