MICRO CONTROL SYSTEMS

**5580 Enterprise Pkwy.
Fort Myers, FL 33905**

**Office: 239-694-0089
Fax: 239-694-0031**

www.mcscontrols.com

Reference & Installation Guide

MCS-THERMOSTAT

*MCS Total
Solution
for all your
Control
Needs*

RoHS Compliant ✓

Energy Efficient and RoHS Compliant

Micro Control Systems, Inc.
5580 Enterprise Parkway
Fort Myers, Florida 33905
PH:(239) 694-0089   FAX:(239) 694-0031
www.mcscontrols.com

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Chapter - 1. MCS-THERMOSTAT

1.1. MCS-THERMOSTAT DESCRIPTION

NOTE: Requires a configuration file for an MCS-CONTROLLER (MCS-MAGNUM or MicroMag) to operate.

The MCS-THERMOSTAT is a temperature and humidity sensing smart device with a backlit LCD display permitting remote adjustments to the MCS controller.

It is powered from the MCS controller's +5vdc supply via a 4 wire connection that can be wired with the communication network cabling in addition.

A menu selection permits the viewing the last alarm condition. An override switch mounted on the left side of the MCS-THERMOSTAT permits temporary occupied operation of the space during an unoccupied period.

The override switch also allows the user to reset lockout alarms.

1.2. MCS-THERMOSTAT INTERFACE

The MCS-THERMOSTAT'S interface allows the viewing of 21 different parameters and has the ability to adjust 9 settings, including cooling & heating set points, operational schedules, holiday schedules, calibration and password protection.

Menu
Access the primary menu.

Enter
Confirms changes and adjustments.

Override
Permits override
Room is occupied
Room is unoccupied.

Selection Up Button ⬆

Selection Down Button ⬇
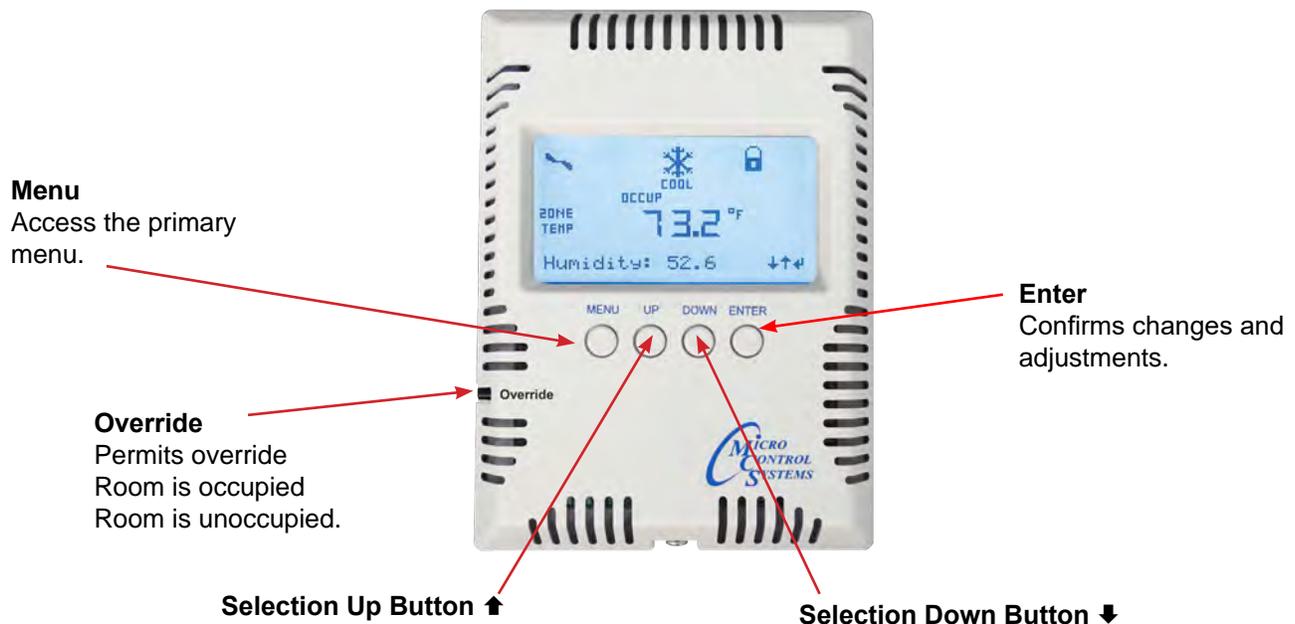
The primary means of cycling through the thermostat's options, menus, and settings- press the up button or down buttons to cycle thru the options.

1.3. The Override Button

Used with scheduling which is setup in the Menu Config for the MCS-THERMOSTAT.

For example, the schedule is setup with the building being 'unoccupied' from 18.01 hrs on Friday until 6:01 hrs on Monday.

If someone works on Saturday, they can push the 'Override' button on the MCS-THERMOSTAT and override the schedule for a set time as programed in the configuration file shipped with your controller and MCS-THERMOSTAT.

Chapter - 2.   THERMOSTAT'S MAIN DISPLAYS

1.1.   The LCD screen displays current status and alarms.

Display shows current views,
OCCUP (Occupied)
UNOCCUP (Unoccupied)
OVERRIDE

Cool Mode

Thermostat is LOCKED

An ALARM is ACTIVE

Fan rotating

Controlling on
Zone Temp

Current Temp, Humidity
in Zone

Current Time and Date
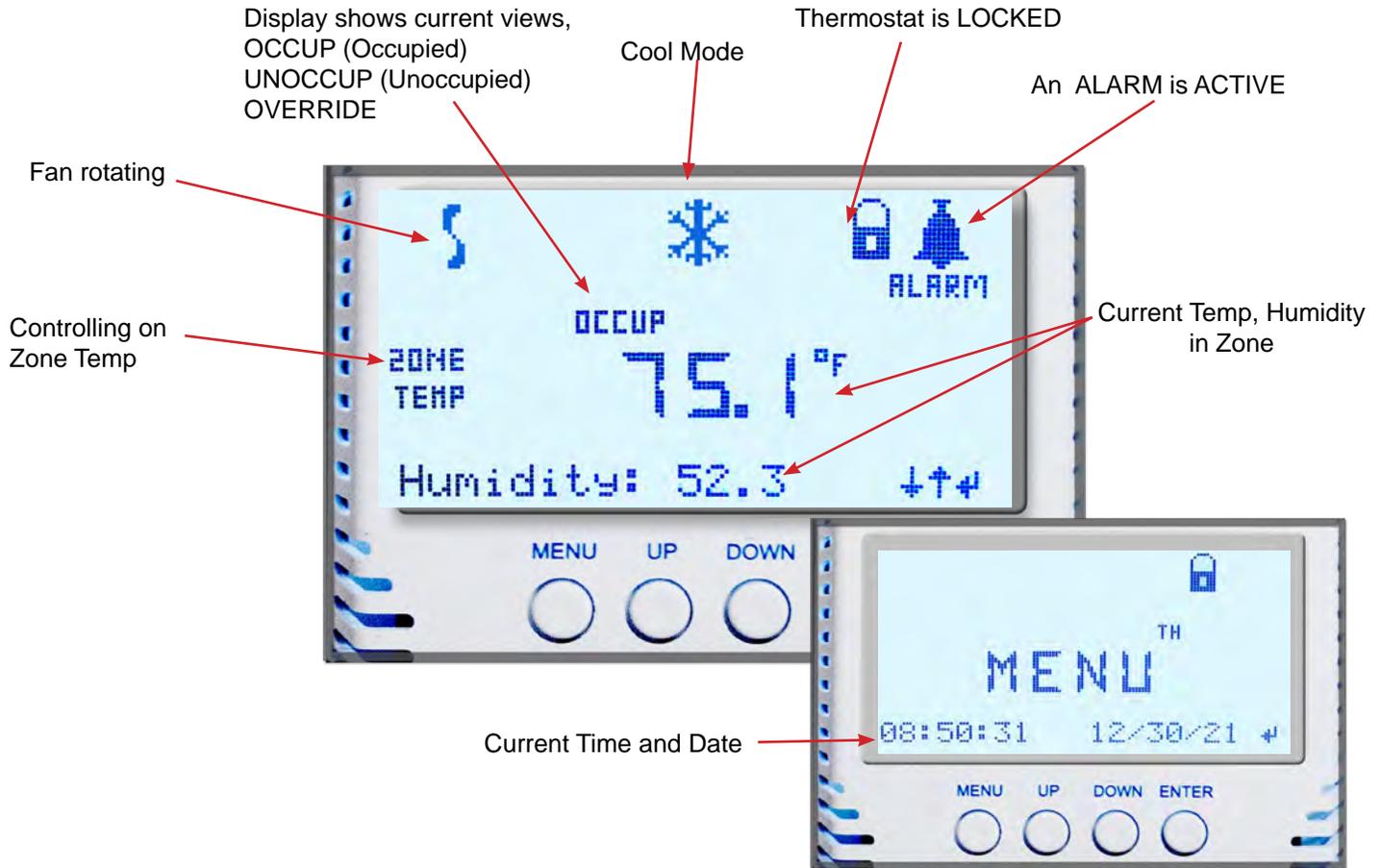
1.2.   Thermostat ICONS
Press the MENU button, press the DOWN button to toggle to MENU CONFIG, press ENTER button, use
DOWN button to move to DISPLAY TEST to view all icons.

Outside air damper
is closed

Unit is in
COOLING mode

Thermostat
is locked

Indicates Speed of FAN
(Slow, Medium, High)

Unit is in
HEATING mode

Unit is in
DEHUMIDIFICATION
mode

Unit has an
active alarm.

Override button-takes unit
out of unoccupied
(set point based)

Day if week Icon

Temperature
Celsius or Fahrenheit

6
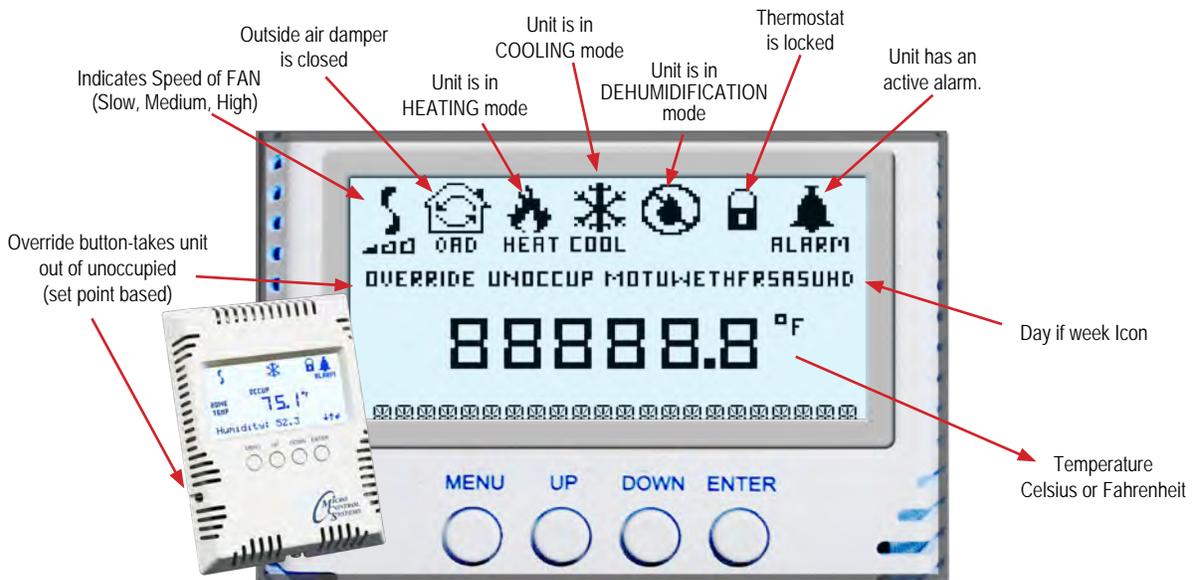
Chapter - 3.   SETTINGS PARAMETERS

3.1.   PARAMETERS
(Depending on configuration file)

1. Run/stop
2. Lockout reset
3. Config menu
4. Co2 target
5. Humidity target
6. Heat target
7. Cool target
8. Humidity calibration
9. Temp calibration
10. Authorization level setting
11. Unit degrees F or C
12. Modify schedules
13. Modify holidays
14. Display test for Icons
15. Adjust backlight
16. Standby backlight
17. Adjust time
18. Adjust date and day of week
19. Thermostat reset
20. Sound alarm stat
21. Zone of supply temp choice

3.2.   ADJUST SETTINGS
(Depending on configuration file)

1. Cool target
2. Heat target
3. Humidity target
4. Co2 target
5. Modify schedules
6. Modify holidays
7. Adjust backlight
8. Adjust time
9. Adjust date and day of week

3.3.   SENSORS - ABILITY TO READ
(Depending on configuration file)

1. Temperature for Cool/Heat
2. Humidity
3. Supply fan fault
4. Run/Stop
5. Outside air damper (door open)
6. Air flow

3.4.   RELAYS VIEW
(Depending on configuration file)

1. ALARM
2. SUPPLY FAN

NOTE: CONFIGURATION FILES FOR EACH CONTROLLER MAY NOT SHOW ALL PARAMETERS, SENSORS OR RELAYS

Chapter - 4. SETUP (APPEARS FIRST TIME THERMOSTAT IS TURNED ON)

Occup SETUP Net Address:

NOTE: THIS MENU WILL APPEAR THE FIRST TIME YOU POWER UP THE THERMOSTAT.

ADDITIONAL CHANGES CAN BE MADE USING THE CONFIG MENU AFTER THE 'INITAL SETUP'

SETTING UP THE THERMOSTAT FOR THE FIRST TIME

AT THIS POINT, YOU SHOULD HAVE WIRED THE THERMOSTAT TO THE MicroMag or MAGNUM controller.

Turn power on to the MicroMag or MAGNUM, Thermostat will power up and enter the **'SETUP MENU'**. The following items will appear in the setup menu:

4.1. NETWORK ADDRESS

The Thermostat is factory set to Network address one (1) This cannot be changed.

4.2. UNITS DEGREES

Allows the user to choose between Celsius and Fahrenheit.
Directions: Use the Up/Down arrows to move between Celsius and Fahrenheit.
Press 'Enter' to select the desired unit degrees and the display will confirm the change.

4.3. AUTHORIZATION LEVEL SETUP

The user will be able to see all functions of the thermostat if the controller's configuration file is setup to allow this. *Some functions of the thermostat may be turned off in the configuration file to help protect unauthorized users from making changes.*

Authorization Levels- The MicroMag and MAGNUM allow several levels of password protection **that have been setup in your thermostat - View, User, Service, Supvsr and Factory.**

The Installer can setup Authorization Levels at this time.
This will allow ONLY users with the correct password to make changes.

(Setup (continued)

OPERATION OF THE THERMOSTAT CAN BE CONTROLLED BY THESE LEVELS OF AUTHORIZATION. SEE EXAMPLE .

SAMPLE TO SHOW HOW TO USE AUTHORIZATION LEVELS FOR THE THERMOSTAT

FUNCTION	VIEW	USER	SERVICE	SUPVSR	FACTORY
Run/Stop Controller	NO	NO	NO	YES	YES
Lockout Reset	NO	YES	YES	YES	YES
Config Menu	NO	NO	YES	YES	YES
Co2 Target	NO	NO	YES	YES	YES
Humidity Target	NO	NO	YES	YES	YES
Heat Target	NO	NO	YES	YES	YES
Cool Target	NO	NO	YES	YES	YES
Humidity Calibration	NO	NO	YES	YES	YES
Temp Calibration	NO	NO	YES	YES	YES
Modify Holiday Dates	NO	NO	YES	YES	YES
Modify Schedule and 24 hour clock	NO	N0	YES	YES	YES

AS SHOWN IN THE 'SAMPLE' ABOVE, AUTHORIZATION LEVEL 'USER' (DEFAULT) WILL HAVE THE LOWEST LEVEL OF ACCESS TO THE THERMOSTAT WHEREAS AUTHORIZATION LEVEL 'FACTORY' WILL HAVE THE HIGHEST AUTHORIZATION FOR MAKING CHANGES TO THE THERMOSTAT.

YOU CAN SET UP THE AUTHORIZATION LEVEL FOR EACH SELECTION SHOWN IN THE 'CONFIG' MENU SO A USER WILL BE LIMITED AS TO WHAT CHANGES THEY CAN MAKE.

4.4.   SOUND ALARM STAT

Hit 'ENTER' - Allows the user to turn alarm on or off.

4.5.   ADJUST BACKLIGHT

Allows the user to adjust the backlight setting from 25% to 100%.

4.6.   STANDBY BACKLIGHT

Hit 'ENTER' - Allows user to make changes to the backlight - OFF or 25% to 100%

4.7.   EXIT SETUP MENU

Press ENTER to exit the SETUP menu, all changes made in the SETUP settings will be saved in the **MCS-THERMOSTAT non volatile** flash memory.

**YOUR THERMOSTAT IS SETUP AND READY FOR USE.
ADDITIONAL CHANGES CAN BE MADE USING THE CONFIG MENU
IF YOU ARE AUTHORIZED**

SETTING UP THE MCS-THERMOSTAT IS THIS SIMPLE. MCS OR YOUR OEM HAS CONFIGURED YOUR THERMOSTAT BASED ON THE SETTINGS YOU REQUESTED. THIS MANUAL WILL DETAIL ADDITIONAL SETTING THAT CAN BE MADE IF YOU ARE AUTHORIZED.

Chapter - 5.   THERMOSTAT MENU SCREENS

Use ⬆ 'UP' ⬇ 'DOWN' and ↵ 'ENTER' BUTTON TO MOVE BETWEEN SETTINGS

5.1.   SETUP (APPEARS FIRST TIME THERMOSTAT IS TURNED ON)

- Net Address (Factory Set At 1)
- Units Degrees (F) Or (C)
- Auth Level Setup
- Sound Alarm Stat
- Adjust Backlight
- Standby Backlight
- Exit Setup Menu

**SEE NEXT PAGE FOR DESCRIPTIONS
OF MENU ITEMS AND
AN EXAMPLE OF AUTHORIZATIONS LEVELS**

5.2.   MAIN

- Unit Status
- Lockout Reset
- Last Alarm
- Time And Date
- Show Version Number
- **Cool Target**
- **Unit (Run/Stop)** *
- Enter Password
- **Config Menu**

***NOTE: SOME MENU OPTIONS MAY NOT SHOW
ON YOUR THERMOSTAT LCD SCREEN.**

**THESE SELECTIONS MAY NOT BE SETUP IN THE
CONFIGURATION FILE FOR YOUR CONTROLLER.**

**AFTER LAST SELECTION HAS BEEN MADE
CLICK ON 'MENU" TO RETURN TO THE
'UNIT STATUS SCREEN'**

5.3.   CONFIG MENU

- **Auth Level Setup**
- **Zone (default) or Supply Temp** **
- **Sound Alarm Stat**
- **Thermostat Reset**
- **Adjust Date & DOW**
- **Adjust Time**
- **Standby Backlight**
- **Adjust Backlight**
- **Display Test**
- **Temp Cal**
- **Modify Holidays**
- **Modify Schedules**
- **Units - F/C**

****SUPPLY TEMP IS ONLY AVAILABLE IN THE
MICROMAG CONFIG SETTINGS IF AVAILABLE
SEE THERMOSTAT CONFIG MENU SETUP
ON HOW TO LOAD**

**CLICK ON THERMOSTAT RESET
PRESS ENTER TO UPDATE.
THE THERMOSTAT WILL REBOOT AND LOCK**

Chapter - 6.   VIEWING THERMOSTAT SCREENS
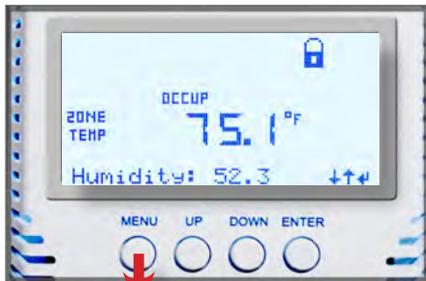
STATUS SCREEN (left to right)
- Locked-no changes allowed
- Building is Occupied
- Set for Zone Temp / Current Temp $^\circ$F
- Current Humidity reading
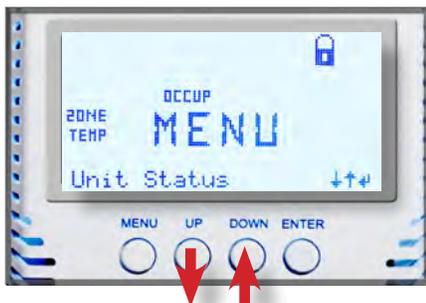
Press MENU Button

MENU SCREEN (left to right)
- Locked-no change allowed
- Building is Occupied
- MENU SCREEN
- Unit Status

Press DOWN button to move to Enter Password

6.1.   Setting Password to get authorized

MENU SCREEN (left to right)
- Locked-no change allowed
- Building is Occupied
- MENU SCREEN
- Enter Password

Press ENTER button to enter password

PASSWORD SCREEN (left to right)
- Locked-no change allowed
- Building is Occupied
- Enter 1st digit, use up/down button to change numeric number
- Press enter to move to next numeric digit
- Enter 4th numeric digit

Press ENTER Button

AUTHORIZATION LEVEL (left to right)
- Unlocked-change allowed
- Building is Occupied
- Password entered
- Showing authorization level

Press MENU Button

11

MENU UNIT STATUS (left to right)
- Unlocked-changes can be made
- Building is Occupied
- MENU SCREEN
- Unit Status

Press MENU button to move to Cool Target

6.2.   Setting Cool Target for Zone Control

MENU COOL TARGET (left to right)
- Unlocked-changes can be made
- Building is Occupied
- MENU SCREEN
- Cool Target

Press ENTER button

SET COOL TARGET CHANGE (left to right)
- Unlocked-changes can be made
- Building is Occupied
- ZONE TEMP / Cool Target 53.0 ^{O}F
- Set Cool Target
- Use UP/DOWN buttons to change Cool Target

Press MENU button to move to

SET COOL TARGET CHANGED (left to right)
- Unlocked-changes can be made
- Building is Occupied
- ZONE TEMP / Cool Target set to 55.0 ^{O}F
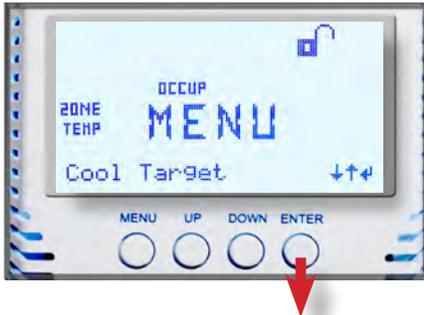
Press MENU button to move back to Menu Unit Status
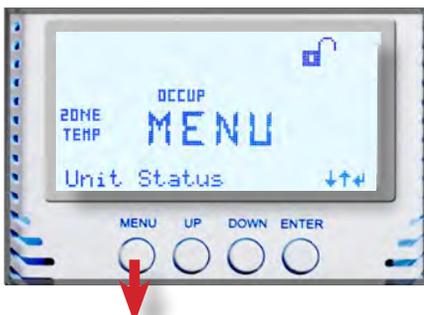
MENU UNIT STATUS (left to right)
- Unlocked-changes can be made
- Building is Occupied
- MENU SCREEN
- Unit Status

Press MENU button to move to Config Menu
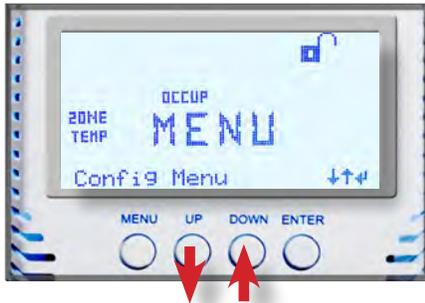
MENU (left to right)
- Unlocked-changes can be made
- Building is Occupied
- Config Menu

Use UP/DOWN button to move thru Menu

CONFIG SCREEN(left to right)
- Unlocked-changes can be made
- Building is Occupied
- CONFIG SCREEN
- Zone or Supply Temp (MicroMag only for Supply)

Press ENTER button to make change from Zone to Supply

CONFIG SCREEN (left to right)
- Unlocked-changes can be made
- Building is Occupied
- CONFIG SCREEN
- Use: Supply Temp *(MicroMag only for Supply)*

Use UP/DOWN button to toggle between Supply Temp or Zone Temp - Press ENTER to return to Menu

MENU SCREEN (left to right)
- Unlocked-changes can be made
- Building is Occupied
- MENU SCREEN
- Unit Status

Use UP/DOWN button to move to Config Menu

This gives you an idea on how to move between the Thermostat menu screens.

The next page will show how to reset and lock the Thermostat so additional changes cannot be made.
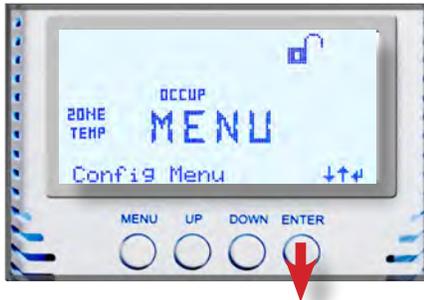
MENU SCREEN (left to right)
- Unlocked-changes can be made
- Building is Occupied
- MENU SCREEN
- Config Menu

Press DOWN button to Thermostat Reset
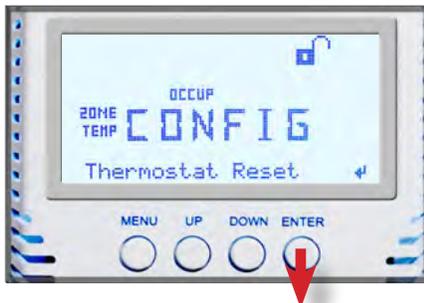
CONFIG SCREEN (left to right)
- Unlocked-changes can be made
- Building is Occupied
- MENU SCREEN
- Thermostat Reset to re-lock

Press Enter button

CONFIG SCREEN (left to right)
- Unlocked-changes can be made
- Building is Occupied
- Config Menu

Press Enter Button to reset- Thermostat will restart

STATUS SCREEN left to right)
- Locked-no changes allowed
- Building is Occupied
- Set for Zone Temp / Current Temp ^{O}F
- Current Humidity reading

Press MENU Button

Chapter 10 shows the different Thermostat screens for the main menu and config menu setup.

NOTE: SOME MENU SELECTIONS MAY NOT SHOW ON YOUR THERMOSTAT LCD SCREEN. THESE SELECTIONS MAY NOT BE SETUP IN THE CONFIGURATION FILE FOR YOUR CONTROLLER.

To make some changes you must be authorize to a higher level.

In the initial setup of the Thermostat, different levels of authorization for each adjustment were set, check with your supervisor for authorization levels used.

Chapter - 7.   MAIN MENU SETTINGS

<u>CLICK ON MENU</u> TO SEE THE SCREENS BELOW
AUTHORIZATION LEVEL MAY BE REQUIRED TO CHANGE

NOTE: SOME MENU SELECTIONS WILL NOT SHOW ON YOUR THERMOSTAT LCD SCREEN, IF THEY ARE NOT SETUP IN THE CONFIGURATION FILE FOR YOUR CONTROLLER.

7.1. UNIT STATUS

Hit 'ENTER' shows status of thermostat.

7.2. CONFIG MENU

Hit 'ENTER' - Allows user to enter Config Menu to make adjustment to the thermostat.

7.3. ENTER PASSWORD

Hit 'ENTER' - Authorization password level for the changes to the thermostat.

7.4. UNIT (RUN/STOP)
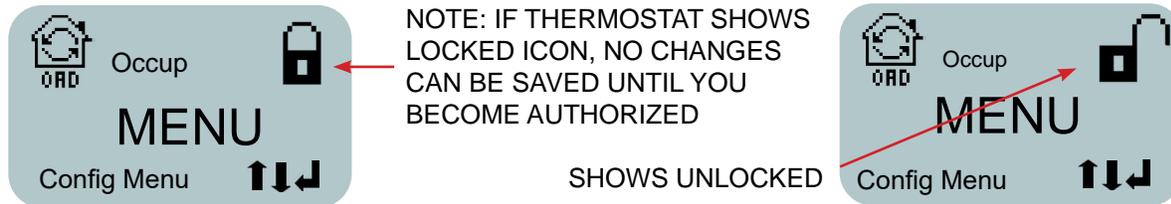
Hit 'ENTER' - Allows user to 'RUN/STOP' the unit controlling the thermostat. **(This must be configured in your controller for viewing on your thermostat).**

7.5. COOL TARGET

Hit 'ENTER' - Allows the user to set the COOL SET POINT FOR THE AREA, higher authorization may be required to change. (can be based on Zone or Supply, MicroMag only)

7.6. HEAT TARGET

Hit 'ENTER' - Allows the user to set the HEAT SET POINT FOR THE AREA, higher authorization may be required to change. (can be based on Zone or Supply, MicroMag only)

7.7. HUMIDITY ENABLE

Hit 'ENTER' - Allows the user to reduce or increase THE HUMIDITY SET POINT FOR THE AREA. Example: Computer server rooms need more humidity to offset static in that zone.

7.8. CO2 TARGET

Hit 'ENTER' - Allows the user to SET THE C02 SET POINT FOR THE AREA.

7.9. SHOW VERSION NUMBER

Hit 'ENTER' - Shows current version of firmware the thermostat is using.

7.10. TIME AND DATE

Hit 'ENTER' - Shows current time and date of unit operating thermostat.

7.11. LAST ALARM

Displays abbreviations for the last three alarms on the first screen before flashing to a second screen displaying the time/date of respective alarm.

For example, in a displayed 'LO DIS PSI' alarm listing, the user interface would switch to a screen displaying 'Jan 31 12:10' as the occurrence time for the first 'LO' alarm before jumping back to the 'LO PSI LO' alarm display and switching to a screen displaying 'Feb 2 12:10' as the occurrence time for the second 'PSI' alarm.

7.12. LOCKOUT RESET

Hit 'ENTER' - Allows used to reset lockout if authorized.

Chapter - 8.   CONFIG MENU SETTINGS

NOTE: IF THERMOSTAT SHOWS LOCKED ICON, NO CHANGES CAN BE SAVED UNTIL YOU BECOME AUTHORIZED

SHOWS UNLOCKED

CLICK ON MENU - USE ↓ DOWN BUTTON TO SEE THE CONFIG MENU

AUTHORIZATION PASSWORD IS REQUIRED

NOTE: SOME MENU SELECTIONS MAY NOT SHOW ON YOUR THERMOSTAT LCD SCREEN. THESE SELECTIONS MAY NOT BE SETUP IN THE CONFIGURATION FILE FOR YOUR CONTROLLER.

8.1.   AUTH LEVEL SETUP

Authorization Levels- The thermostat allows five levels of passwords -
View, **User**, **Service**, **Supervisor,** and **Factory**.

8.2.   ZONE(default) SUPPLY TEMP (MicroMag only)
(Supply Temp ONLY ON MicroMag FIRMWARE VER 2.00E, MicroMag Config 18.00N and up)

Hit 'ENTER' - Allows the user to change between showing 'ZONE TEMP' or 'SUPPLY TEMP' if "SUPPLY TEMP" is used in the config setup, MicroMag only.

8.3.   UNIT = DEGREES

Hit 'ENTER' -Allows the user to change between Celsius and Fahrenheit.
Directions: Use the Up/Down arrows to move between Celsius and Fahrenheit. Press 'Enter' to select the desired unit degrees and the display will confirm the change.

8.4.   MODIFY SCHEDULES

Unlike Thermostats that are used at home and in an some office buildings, the MCS Thermostat 'SCHEDULES' controls the run/stop of the controller's cool target and heat target setting only.

Think of the Thermostat 'SCHEDULES' as controlling whether a building or room is 'OCCUPIED or 'UNOCCUPIED'.
We can still allow the building or room to be cooled or heated, but with target setting, we can lower (or raise) the temperature depending on whether the building or room is 'OCCUPIED'.

For example if you set 'SCHEDULE ONE' to start at 8:00 am the thermostat will start either the cooling process or heating process of the unit based on the cooling/heating targets that you have setup in the Thermostat or configuration of the controller. Setting 'SCHEDULE ONE' to end at 17:00 (5:00 pm) the Thermostat can change how the building or room is heated or cooled.

The advantage of the MCS Thermostat is that you can override the target settings of the UNIT'S heating, cooling and humidity from the thermostat without going to the actual unit.

CONFIG MENU (continued)

8.4.1   SCHEDULES DAYS OF WEEK AND HOLIDAYS

Schedule setting start with Sunday as the first day.

1. Press Menu button to **'CONFIG MENU'**, press ↵ **'ENTER'**

2. Use ↓ 'DOWN' to **'MODIFY SCHEDULES'**, press ↵ **'ENTER'**

3. The first schedule day will appear on the screen **'SUN Schedule 1 start'** press ↵ **'ENTER'** to accept this day.

4. The next screen display will show the Hour **'BLINKING'** - enter the hour, press ↵'ENTER' to move to the minutes**.** After you set the minutes, press ↵**'ENTER'** to accept, the following screen will appear **'Prs Enter to continue'. The information will be sent to the controller.**

5. **Be sure to set the 'START and 'END TIMES' for each day for 'SCHEDULE 1' and for 'SCHEDULE 2' before proceeding to the next day on the Thermostat.**

6. **IF YOU DO NOT SEE THE 'HOUR BLINKING' YOU FORGOT TO PRESS ENTER FOR THE NEXT SCHEDULE DAY.**

SHOWS SCHEDULE FOR 24 HOUR OPERATION

8.4.2   USE SCHEDULING FOR MCS-THERMOSTAT

You must be authorized to make these changes using the MCS-THERMOSTAT or MCS-CONNECT.

Below is a screen shot from MCS-CONNECT showing what the schedule settings looks like in the configuration setup. Basically this is what you are setting up when you are setting the 'SCHEDULES and HOLIDAYS' times in the Thermostat.

Time building is **'OCCUPIED'** chiller running

Time building is **'UNOCCUPIED'** using night setback or chiller is off

IMPORTANT

OVERRIDE SW on MCS-THERMOSTAT use when you are occupying the building for a short period, 1 to 2 hours depending on what is setup in your configuration file.

Holiday Schedule chiller turns on for brief period

Day	#1 Time On	#1 Time Off	#2 Time On	#2 Time Off
Sunday	9:00	12:00	0:00	0:00
Monday	6:01	18:00	0:00	0:00
Tuesday	6:01	18:00	0:00	0:00
Wednesday	6:01	18:00	0:00	0:00
Thursday	6:01	18:00	0:00	0:00
Friday	6:01	18:00	0:00	0:00
Saturday	9:00	12:00	0:00	0:00
Holiday	9:00	12:00	0:00	0:00

Holiday #	Start Month	Start D...	End Month	End Day
1	December	25	December	25
2	April	15	April	15
3	May	30	May	30
4	July	4	July	4
5	September	5	September	5
6	November	24	November	25
7	December	23	December	26
8	December	25	December	25

Holidays uses the day of the week to see what schedule to follow for 'UNOCCUPIED' or shutdown

There are several ways to setup a schedule for the MCS-THERMOSTAT and how the schedule is used.

- Building the configuration file created for your controller with the MCS-THERMOSTAT. (OEM or MCS ONLY)

- Using MCS-CONNECT - connected to your controller with the MCS-THERMOSTAT.

- Using the MCS-THERMOSTAT to make changes. (changes will be updated in MCS-CONNECT (with a restart)

8.4.2.1.   SCHEDULING FOR 'OCCUPIED' or 'UNOCCUPIED'

What happens to your chiller is based on how the configuration file is setup for your controller.

1. **MICROMAG CONFIGURATION SOFTWARE (a)**

   b. **Occupation State** - Schedule will be based on when the building is 'OCCUPIED'. Example below shows the building is occupied from 6:01 until 18:00 hours. At 18:01 the building is 'UNOCCU-PIED'. The chiller will go into a reduced 'COOL' or 'HEAT' target based on setpoint #6 'CoolNiteStbk" and or setpoint #7 'HeatNiteStbk" which are setup in your configuration file.

   ✱ c. <u>ON/OFF</u> **STATE**- When this state is used the chiller will shut 'OFF' when the building is **'UNOCCUPIED'**.
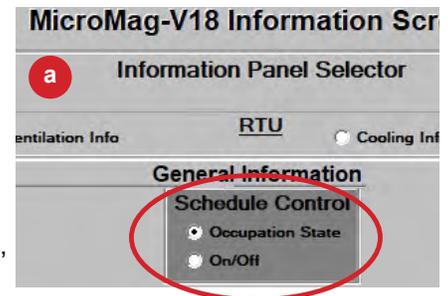
2. **MCS-MAGNUM CONFIGURATION SOFTWARE (b)**

   a. <u>Night Setback</u> - Occupied can be indicated by a schedule being true or by the Occupied SW being on. This can be a digital type or input from a BMS.
   If unoccupied setpoints are adjusted with their night setback values.

   b. **ON/OFF** - When this state is used following the set schedule below the chiller will shut 'OFF' when the building is unoccupied.

   c. **Occupied SW**- OCCUPIED or NOT USED

   d. **Override SW** - Set up an override SI as digital and select it here.
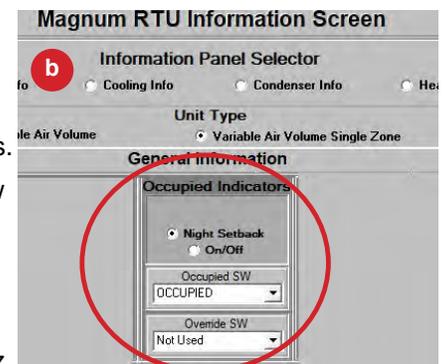
✱ In cold weather when heat is needed use Night Setback, chiller runs 24/7

8.5.   TEMP CAL

Allows the user to make changes to the temperature setting of the Thermostat using a calibrated hand held temperature meter to check the current temperature of the area.

Directions: Use the Up/Down arrows to move between the offset range. Press 'Enter' to select the desired temperature offset and the display will confirm the change.

8.6.   HUMIDITY CAL

Allows the user to make changes to the humidity setting of the Thermostat using a calibrated hand held meter to check the current humidity of the area.

Directions: Use the Up/Down arrows to move between the offset range. Press 'Enter' to select the desired temperature offset and the display will confirm the change.

8.7.   DISPLAY TEST

Allows the user to test the thermostat to make sure all icons are working.

8.8.   ADJUST BACKLIGHT

Allows the user to adjust the backlight setting from 25% to 100%. Change takes place in120 secs. LCD will go to 100% each time you touch a button to make an adjustment.

8.9.   STANDBY BACKLIGHT

Hit 'ENTER' - Allows user to make changes to the backlight - OFF or 25% to 100%. Change takes place in120 secs. LCD will go to 100% each time you touch a button to make an adjustment.

8.10.   ADJUST TIME

Allows the user to change the displayed time from the MCS-THERMOSTAT.
Directions: Use the Up/Down arrows and Enter button to first adjust the hour per a 24-hour schedule (ex. 1:00am is 0100 and 1:00pm is 1300) and press 'Enter' to move on to the minutes. After adjusting the minutes, press 'Enter' to move on to the seconds. Press 'Enter' to complete the time adjustment.

8.11.   ADJUST DATE and DOW

Allows the user to change the displayed date and day of the week from the MCS-THERMOSTAT.

8.12.   THERMOSTAT RESET

Hit 'ENTER' to update-'RESTARTING THE UNIT' (THIS RE LOCKS THE THERMOSTAT)

8.13.   SOUND ALARM

Hit 'ENTER' - Allows the user to turn alarm on or off.

Chapter - 9.   MCS-CONNECT - VIEWING THERMOSTAT

Open MCS-CONNECT, screen below shows the status of the 'Temperature, Humidity and sensor 1-3 shows the Thermostat is in auto mode, 'Run'.

Thermostat showing Current temp, Humidity, Chiller is running

9.1.   CHANGES TO MCS-THERMOSTAT USING MCS-CONNECT

- Changes can be made to the thermostat, if authorized thru MCS-CONNECT.
- Sensor input changes - Cool/Heat/Humidity, CO_2, etc.
- Run/Stop, etc.

1. Make changes in MCS-CONNECT.
2. Go to Config menu on MCS-Thermostat, Reset MCS-Thermostat.
3. Changes made in MCS-CONNECT will show on the MCS-Thermostat.
4. Changes can be made on the MCS-Thermostat and will show on MCS-CONNECT.
5. Disconnect MCS-THERMOSTAT, and restart MCS-CONNECT for changes to show.

REMEMBER THAT ALL CHANGES WILL BE LOST IF YOU TRANSMIT A NEW OR OLD CONFIGURATION FILE TO YOUR MCS-THERMOSTAT THAT WERE MADE ON THE MCS-THERMOSTAT OR THRU MCS-CONNECT AND NOT CHANGED IN YOUR CONFIGURATION FILE

Chapter - 10.   INSTALLATION

The MCS-THERMOSTAT is powered by a +5vdc supply from an MCS controller via a two wire connection that can be wired with the communication network cabling. Improper wiring or installation may damage the thermostat. Wiring must conform to local and national electrical codes.

WARNING!
Before installing the thermostat, turn off all power to the unit. There may be more than one power disconnect. Electrical shock can cause personal injury or death.

NOTE: DO NOT INSTALL THE THERMOSTAT WHERE IT MAY BE AFFECTED

BY AIR FROM NEARBY DUCT WORK, ELECTRONIC EQUIPMENT, ETC.

10.1. REQUIRED FOR INSTALLATION

- An MCS-THERMOSTAT with a +5 volt power supply

- 1/4" Phillips screwdriver
- 5/64" flathead screwdriver
- 2 ½ pan machine screws (included)
- 1 Wire cutter/stripper
- 4 Wire 22 to 20 awg Shielded Cable
- J-Box (USA or International)

10.2. MOUNTING LOCATION

- Install the **MCS-THERMOSTAT** on an interior wall. Exterior walls that are poorly insulated can affect the Thermostat temperature and humidity readings and may lead to wasted energy.

- Install the **MCS-THERMOSTAT** away from drafts, direct sunlight or anything that would cause the temperature to be artificially high or low.

- Install the **MCS-THERMOSTAT** so that it's not blocked by doors or other obstructions.

- The Thermostat should be mounted approximately 5' (1.5m) above the floor.

10.3. WIRING AND DISTANCE

Use 4 wire 22 to 20 awg Shielded Cable for installation. The MCS-THERMOSTAT can be installed up to 1000 feet from the MCS CONTROLLER.

Chapter - 11.   INSTALLATION - MOUNTING

11.1. UTILIZING J-BOX

MCS recommends you install the **MCS-THERMOSTAT** utilizing a J-Box.
Prior to installing the **MCS-THERMOSTAT** punch out the corresponding mounting holes on the **MCS-THERMOSTAT** housing based on the J-box you are utilizing.

International Style Junction Box   USA Style Junction Box

USA

International

11.2. PUNCTURE SMALL HOLE

Puncture a small hole in the grommet on the back side of the thermostat. You want the wires to be tight so no air passes through affecting the thermostat's reading.

11.3. OUTPUT WIRES

Push the output wires from the **MCS Controller** through the rear hole of the **MCS-THERMOSTAT'S** mounting plate.
It may be good practice to wait until the wires are in position to be attached to the

MCS-THERMOSTAT before they are stripped or cut with a tool.

11.4. SCREWS

Using a ¼" Phillips screwdriver, insert one of ¼" machine screws into one of the mounting slots depending on the J-box you are utilizing and tighten the screw to hold the mounting wall plate into position.

Screw the second ¼" machine screw into the lower mounting slot to secure the wall plate.

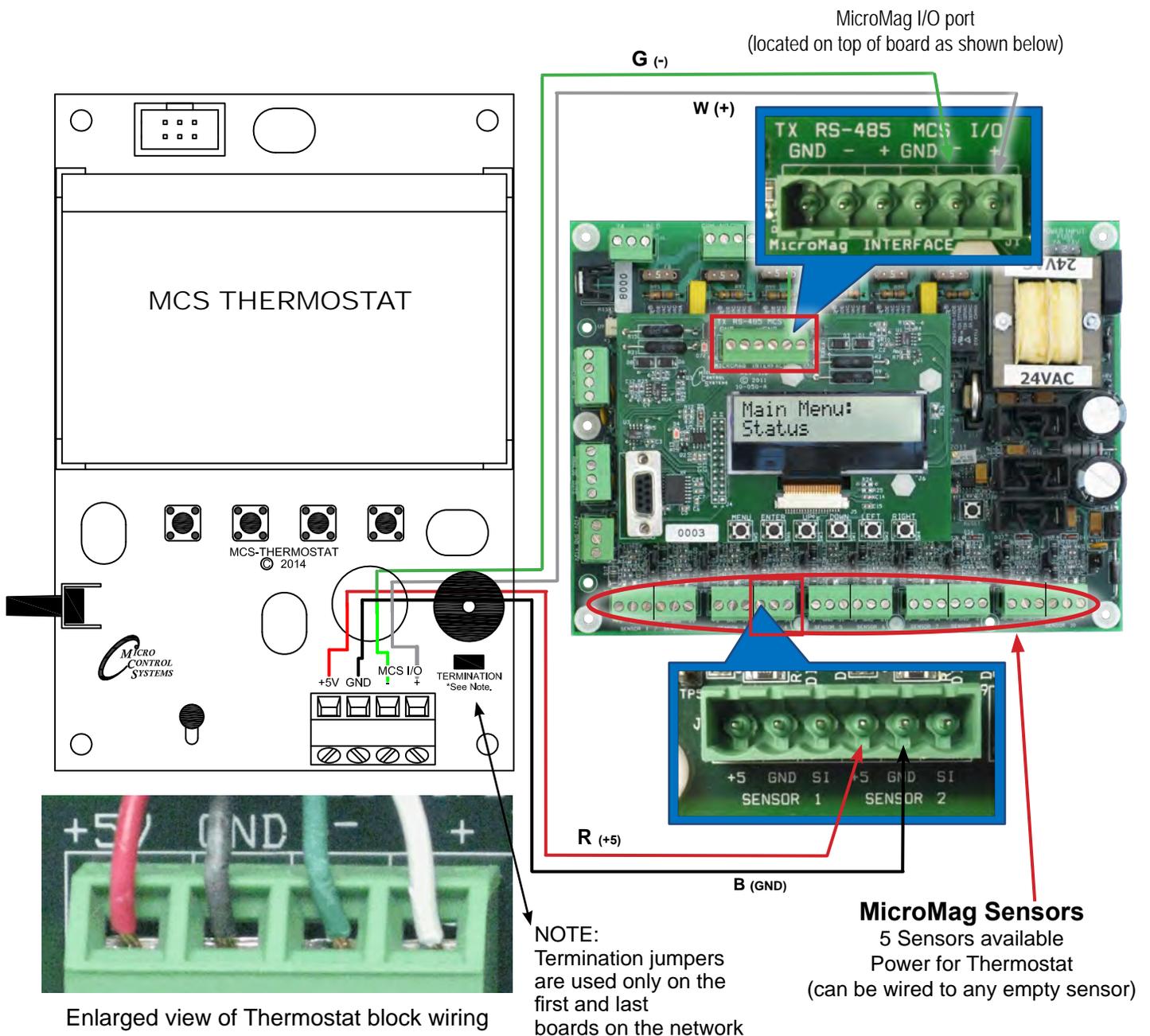# Chapter - 12.   WIRING INSTRUCTIONS TO CONTROLLER

12.1. MicroMsag Rev. 6.0 (or less) 24VAC, 115VAC and 230VAC

TURN POWER OFF TO CONTROLLER AND THERMOSTAT FIRST
Begin wiring (not supplied) from the MCS CONTROLLER to the MCS-THERMOSTAT as shown in the wiring diagram. Wires are routed thru the back of the MCS-THERMOSTAT.

ONE THERMOSTAT PER MCS-CONTROLLER

MicroMag I/O port
(located on top of board as shown below)

G (-)

W (+)

TX RS-485 MCS I/O
GND − + GND − +
MicroMag INTERFACE

MCS THERMOSTAT

Main Menu:
Status

24VAC

MCS-THERMOSTAT
© 2014

+5V GND MCS I/O TERMINATION
              −   +   *See Note.

+5 GND SI +5 GND SI
SENSOR 1   SENSOR 2

R (+5)

B (GND)

NOTE:
Termination jumpers are used only on the first and last boards on the network

MicroMag Sensors
5 Sensors available
Power for Thermostat
(can be wired to any empty sensor)

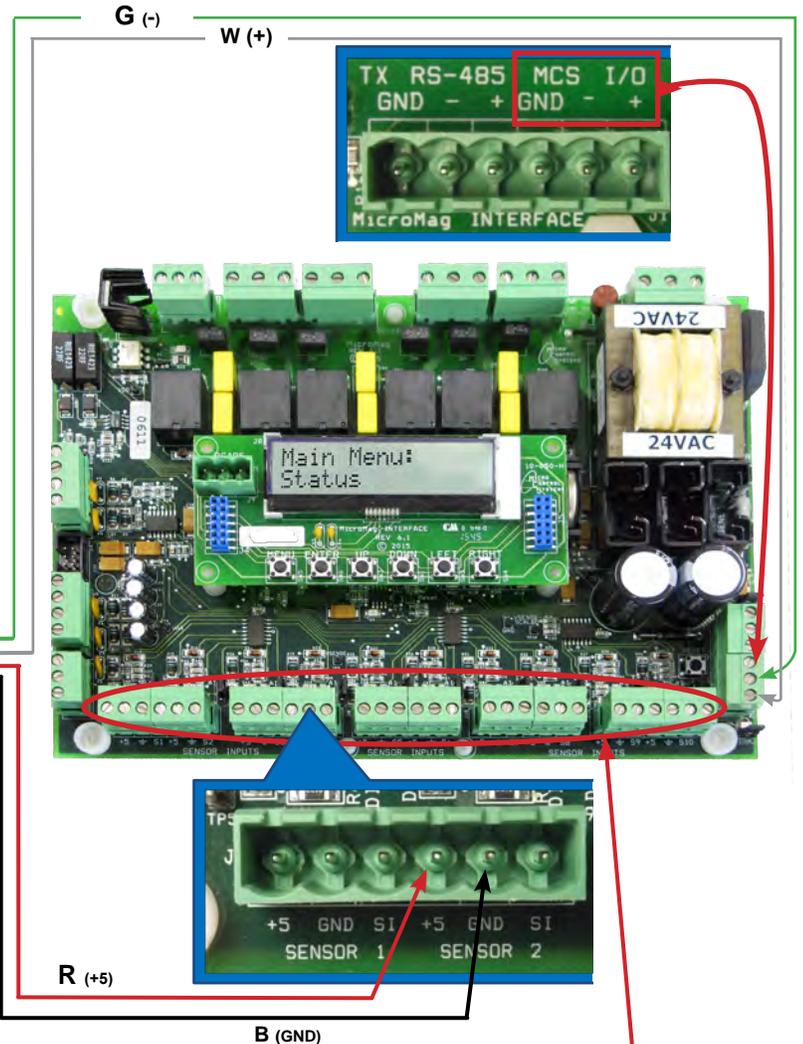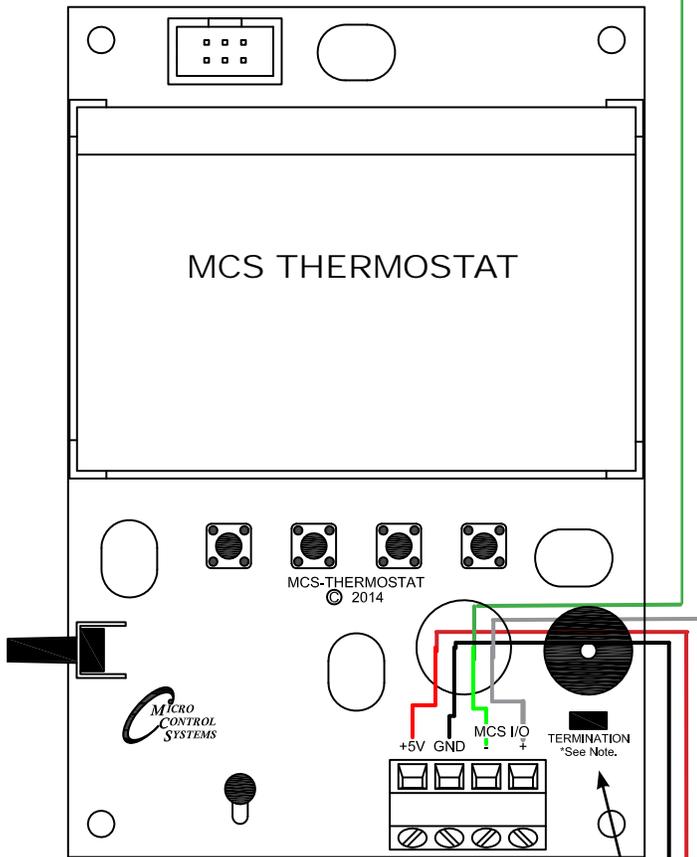Enlarged view of Thermostat block wiring

12.2. MicroMag Rev. 6.1 - 24VAC, 115VAC AND 230VAC

TURN POWER OFF TO CONTROLLER AND THERMOSTAT FIRST
Begin wiring (not supplied) from the MCS CONTROLLER to the MCS-THERMOSTAT as shown in the wiring diagram. Wires are routed thru the back of the MCS-THERMOSTAT.

ONE THERMOSTAT PER MCS-CONTROLLER

MicroMag I/O port
(located on right of board as shown below)

G (-)   **W** (+)

TX RS-485   MCS I/O
GND - +   GND - +

MicroMag INTERFACE

MCS THERMOSTAT

Main Menu:
Status

24VAC

24VAC

MCS-THERMOSTAT
© 2014

MCS I/O
+5V GND   - +   TERMINATION
*See Note.

TP5
J
+5 GND SI   +5 GND SI
SENSOR 1   SENSOR 2

R (+5)

B (GND)

MicroMag Sensors
5 Sensors available
Power for Thermostat
(can be wired to any empty sensor)

+5V GND - +

Enlarged view of Thermostat block wiring

NOTE:
Termination jumpers are used only on the first and last boards on the network

12.3. MicroMag/MAGNUM - 12 VOLT SYSTEMS

TURN POWER OFF TO CONTROLLER AND THERMOSTAT FIRST

*Note:

1. Termination jumpers are used only on the first and last boards on the network.

2. The order of the boards does not matter for MCS I/O communications.

   (Magnum, RO, SI, IO, Thermostat)
   (RO, Magnum, Thermostat, SI, IO)
   (SI, Thermostat, Magnum, RO, SI)

3. For +5 and Ground for Thermostat use a Spare Sensor Input.

   If no Spare is available wiring to an already occupied Sensor Input is permitted.

   Wires are routed thru the back of the MCS-THERMOSTAT.

Spare or Occupied Sensor on
MCS-MAGNUM or
MCS-MicroMag or
MCS-SI-BASE/EXT or
MCS-IO-BASE/EXT
*See Note.
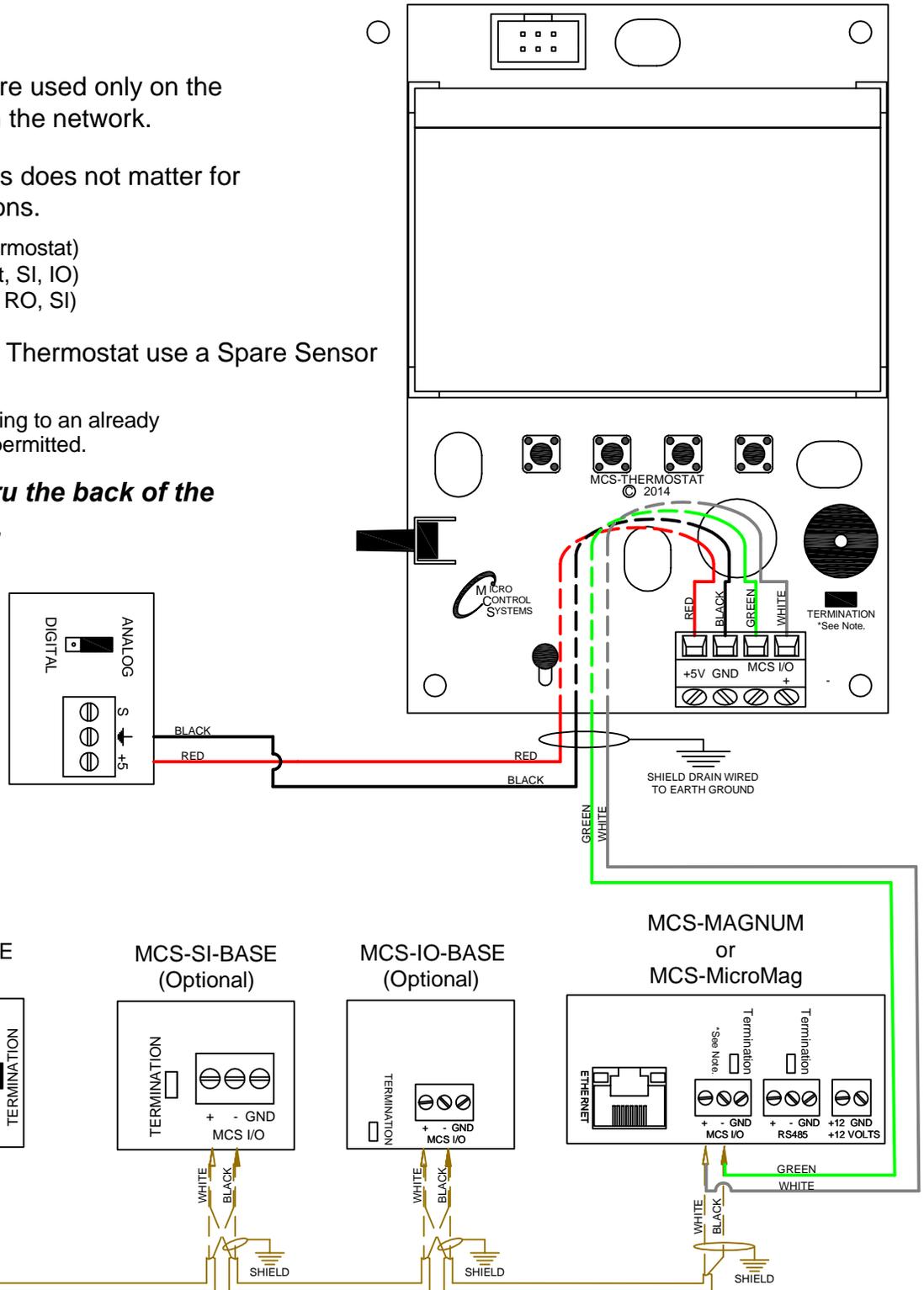
ONE THERMOSTAT PER MCS-CONTROLLER

Chapter - 13.   UPDATE FIRMWARE ON THERMOSTAT

13.1. MCS-Thermostat firmware upload

Loading new 'Firmware' to the Thermostat (requires proper authorization)

Consult support@mcscontrols.com for upgrading your Thermostat firmware and acquiring the necessary TERMINAL BLOCK CABLE TO ATTACH TO THERMOSTAT.

1. **REMOVE COVER FROM THERMOSTAT AND REMOVE THE WIRES FROM THE PLUS AND MINUS FOR THE COMMUNICATION OF THE THERMOSTAT.**

2. **CONNECT THE TERMINAL BLOCK SUPPLIED TO THE THERMOSTAT- WHITE WIRE TO PLUS(+) AND THE BLACK WIRE TO GROUND (-) .**
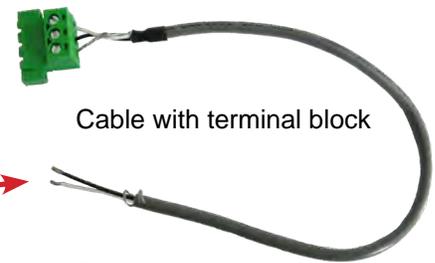
Cable with terminal block

Enlarged view of Thermostat block wiring

3. **USING A MCS-USB-RS485 CABLE (not supplied) PLUG THE RS-485 END INTO THE SUPPLIED TERMINAL AND THE USB END INTO YOUR COMPUTER.**

4. **Open MCS-Connect and select Setup.**

5. **In the drop down menu select Communications.**
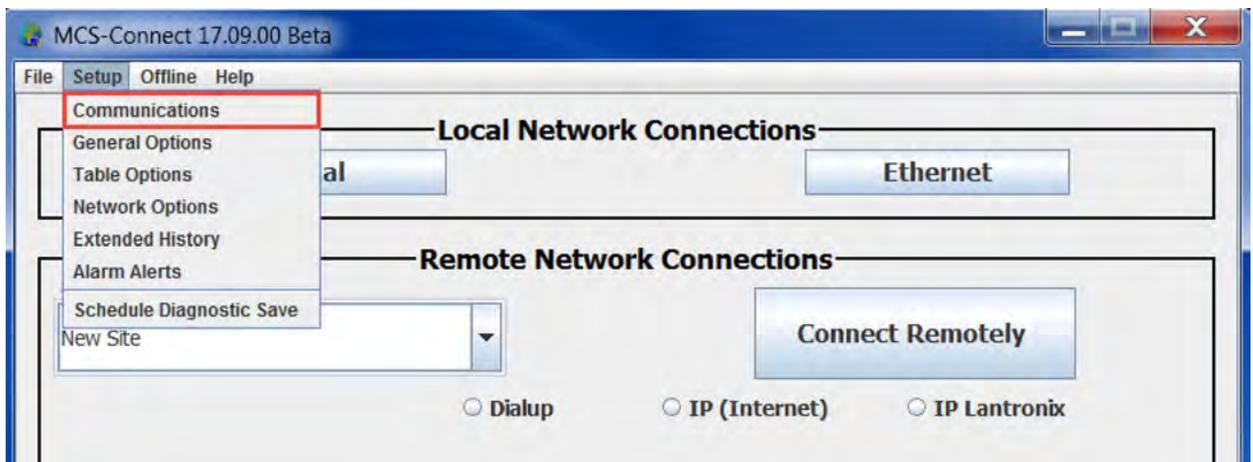
6. **On the communications Setup Screen select the LOCAL Comm. COM port from your computer and then set the** <u>baud rate to 38400</u>**. Press Save and click SERIAL to connect with the MCS-Thermostat.**
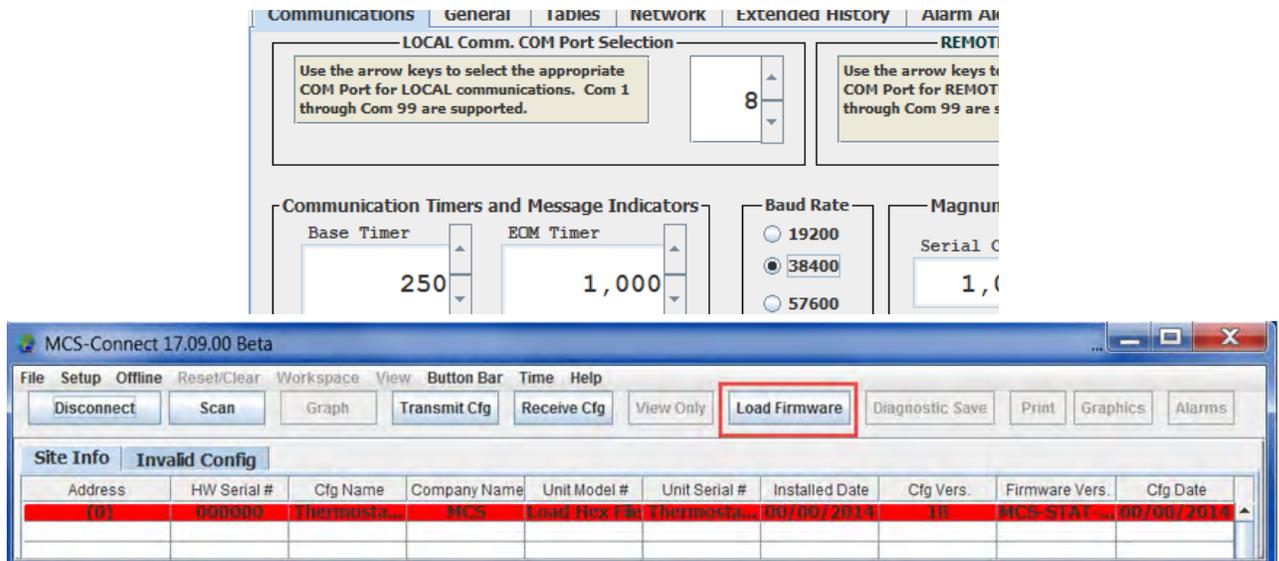

7. **When MCS-Connect screen opens a red line will appear on the site info showing the Software information of the MCS-Thermostat.**

8. **While on the site info screen press 'Load Firmware' and select the location for the new Hex file to load the new firmware. (supplied by MCS-SUPPORT)**

9. **When the firmware finishes downloading to the thermostat:**

   1. **Remove the TERMINAL BLOCK wiring from the thermostat.**

   2. **Re-connect the MCS-Thermostat to the MCS controller.**

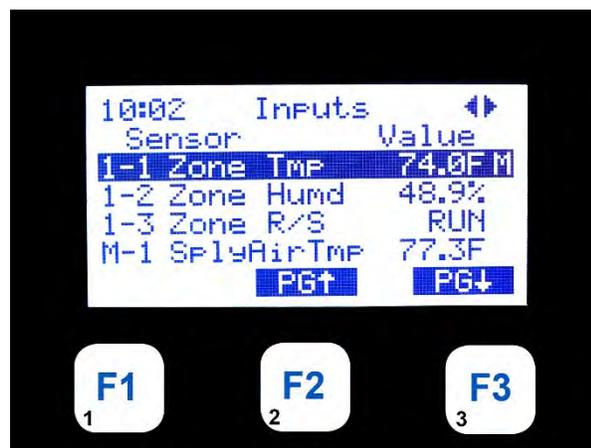# Chapter - 14. MAG-KEYPAD - VIEWING THERMOSTAT

Depending on configuring file used, examples of Keypad setup for reading the temperature, Humidity, etc. Changes can be made if authorized.
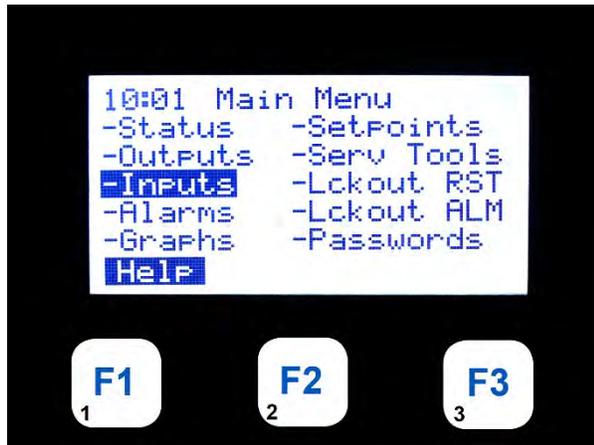
Main Menu - Inputs
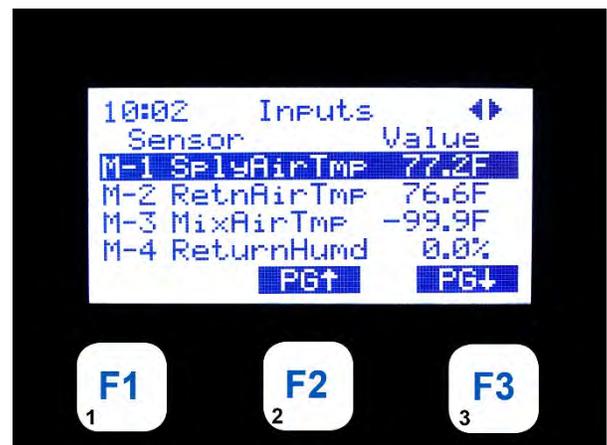
1st 4 inputs

F3 down to Zone Tmp, Zone Humd
and Zone R/S

Chapter - 15.   TROUBLESHOOTING
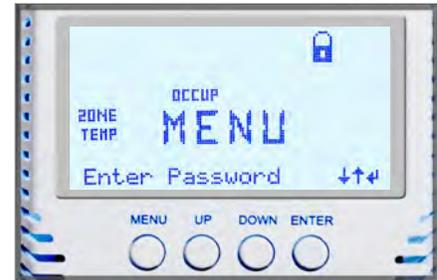
14.1. COMMUNICATION LOST

Thermostat will not turn on, no display, possible cause, loss communication with the controller.

Possible Causes	Solutions
MCS-I/O COMMUNICATION	Check to make sure you have the wiring correct to the Thermostat (see wiring in install guide). Check to see that the Thermostat and Controllers are Terminated correct. In MCS-CONNECT or Keypad, check to see if the baud rate is correct (28,400)

14.2. THERMOSTAT IS IN LOCKED MODE

MCS-THERMOSTAT is locked to prevent changes.

Some changes, Cool Target, Heat Target, Humidity Target, etc. can be changed if authorization allows for these changes. Passwords can be changed in the Menu Config to limit who can make changes.

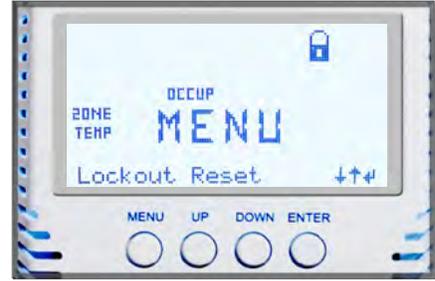| Possible Causes	Solutions
LOCKED UNLOCKED	MCS-THERMOSTAT remains in locked mode until the proper password is entered. Press the Menu button until you see Password - press enter, than your first password number - press enter until the correct password has been entered. LOCKED ICON SHOULD SHOW UNLOCKED. Password Code will lock back in 2 minutes or if you reset the MCS-THERMOSTAT by using Config setting in the menu.

14.3. TEMPERATURE WON'T CHANGE

Thermostat has been programmed with a schedule. Setpoints in the configuration program are controlling the temperature of the building in 'UNOCCUPIED' and 'OCCUPIED' setback mode.

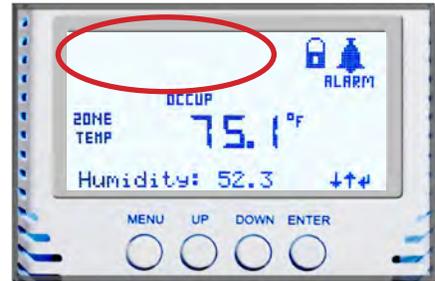| Possible Causes	Solutions
UNOCCUPIED MODE	Use the 'OVERRIDE' button to temporarily override the setting being used in the "UNOCCUPIED' mode.

14.4. Max. LOCKOUTS PER DAY

Authorization level can be set to reset a Lockout.

Possible Causes	Solutions
Critical situation is encountered that could cause harm to the chiller package	Reset Lockouts – Lockouts can be reset without authorization from the keypad or MCS-Connect program; however if the lockout condition has not been corrected, the system will again be forced into the LOCKOUT state..

14.5. ICONS NOT SHOWING

If your MCS-THERMOSTAT LCD is not displaying the Icons, follow instructions below.

Possible Causes	Solutions
	To make sure all of your Thermostats Icons are working - Press Menu to get to the Config Menu using the up/down arrows until you see Display Test- press enter - all icons should show on the screen as shown on the right. Try resetting the Thermostat from the Thermostat config file.

14.6. MSC-THERMOSTAT STAYS IN HEAT / COOL MODE

THERMOSTAT STAYS IN HEATING OR COOLING MODE AND WON'T CHANGE

Possible Causes	Solutions
Configuration program not setup correct, Chiller reversing valve	Check your Cooling and Heating Set Points - consult HVAC Supervisor

TO DISABLE THE CURRENT PASSWORD - AT THE MENU LEVEL, PRESS MENU UNTIL YOU SEE ENTER PASSWORD. ENTER A PASSWORD THAT IS NOT USED BY THE SYSTEM TO RELOCK THE UNIT SO UNAUTHORIZED CHANGES CANNOT BE MADE.

Revision Page

Date	Author	Description of Changes
5-16-14	KLM	Restructured manual
5-18-14	JGW	Added Stat Pictures and reworked
12-8-14	DEW	Restructured Manual to Indesign
1-6-15	DEW	Edits made as per Mac
1-7-15	DEW	Edits per Brian, changed wiring dwg
1-8-15	DEW	Edits made as per Brian
1-12-15	DEW	Edits made as per Brian, setting menu\
1-16-15	DEW	Edits made
6-01-15	DEW	Edits made to wiring and setup config
6-25-26-15	DEW	Edits made to Menu items
6-30-15	DEW	Edits from JGW
7-01-02-15	DEW	Edits from JGW and support
7-13-15	DEW	Edits made to manual
7-30-15	DEW	Edits made to manual
12-2/3-15	DEW	Add run/stop feature, add new MicroMag board to wiring
01-4-16	DEW	Add instructions for firmware update
03-10-21	DEW	Change to Rev. 1.6 - add 12 volt wiring
04-08-16	DEW	Add wiring and distance on installation page
06-04-2021	DEW	Updates with Firmware Ver 2.00E
01-06-2022	DEW	Add screen shots, edit type and layout, check for relays, sensor readings

The MCS Commitment is to provide practical solutions for the industries
needs and to be both a leader and partner in the effective use of
Microprocessor controls.

Micro Control Systems, Inc.
5580 Enterprise Parkway
Fort Myers, Florida 33905
PH:(239) 694-0089   FAX:(239) 694-0031
www.mcscontrols.com

MICRO CONTROL SYSTEMS

Providing HVAC/R Control Solutions Worldwide

5580 Enterprise Pkwy. Fort Myers, FL 33905
Office: (239) 694-0089
Fax: (239) 694-0031
www.mcscontrols.com