LG MultiSITE MS8350 Room Controller

User Interface Application Guide

Fan Coil Unit - Four Pipe Heating/Cooling, Three Speed Fan, Zone Control

AIR CONDITIONING TECHNOLOGIES

Table of Contents

Before You Begin

The LG MS8350 Fan Coil Unit 4-Pipe Heating/Cooling with 3-Speed Fan Standard Application Guide provides a pre-engineered, packaged solution for applying the MS8350 controller. This packaged solution includes control wiring diagrams, controller configuration instructions, and MultiSITE Supervisor Device Builder template. To use MultiSITE Supervisor Template, the following prerequisites must be met.

- LG MultiSITE Supervisor must be installed and licensed on Personal Computer.
- LG VM3 is licensed and commissioned.
- LG MS8350 controller running firmware v2.4.0 or greater.
- LG Device Builder Advantage Software is downloaded and installed. Download Device Builder Advantage from the LG Niagara Central Forum: https://www.niagara-community.com/s/group/0F9D0000000HM6UKAW/lg-niagara-central-forum. Follow the included guide to install Device Builder Advantage.
- Follow “Device Template Deployment” instructions located in the Device Builder Advantage User Guide Section 3.2.

NOTE: LG Device Builder Advantage Software is available to LG VM3 Partners for download from the LG Niagara Central Forum. Refer to LG Device Builder Advantage installation document for details on installing Device Builder templates.

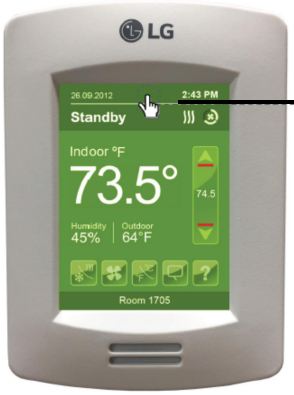
WARNING: Before changing settings or wiring connections on controller, ensure controller is de-energized, all equipment controlled by controller is de-energized, and ensure proper equipment lock-out-tag-out procedures are performed. Failure to perform safety procedures can result in personal injury or death. Failure to perform safety procedures can result in equipment damage or failure.

HMI Display

The MS8350 Human Machine Interface (HMI) is configurable and allows display functions such as Date, Time, Humidity, Input/Output Configuration, and Setpoint adjustment by setting various parameters.

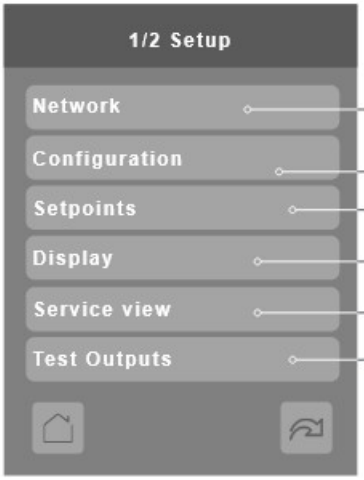
Device Setup Screen

Configuring the MS8350 for this standard application requires adjusting various parameters in the Device Setup Screen(s). Enter the setup screens and familiarize yourself with available menus and buttons before proceeding to Step-By-Step Setup Instructions.



Touch and hold this point for 3 seconds to enter setup mode

Setup Screen 1/2



BACnet MS/TP, Modbus and Zigbee network settings (Zigbee network settings appear only if Zigbee feature is available)

Parameter configuration menu

Setpoint settings

Display settings

Status display (Read Only)

Test outputs settings

Setup Screen 2/2

Select language

Set clock, schedule and occupancy

Automatic Demand Response

Wireless Ecosystem settings (shows only if Zigbee is available)

LUA scripting (shows only if LUA script uploaded)

Fan Coil Unit with 4-Pipe Heat/Cool and 3-Speed Fan Application Settings

The following MS8350 settings will configure the controller for Fan Coil Unit Zone Control with 4-pipe Heating/Cooling, Floating Control Hot/Chilled Water Valve Actuators, 3-Speed Fan, and BACnet MS/TP network communication.

To configure the MS8350 controller settings, enter the Device Setup Screen as described in the previous section. **NOTE:** Default settings are shown in the following controller screen images. Follow the steps described to configure your controller for this application.

Network Settings

Step 1 Within Setup Screen 1/2, select "**Network**".

Step 2 In the Network screen, set **Wired Protocol** to "**BACNET MSTP**"

1. Press to select wired protocol.

2. Press Down Arrow until **BACNET MSTP** is displayed for wired protocol.

Step 3 While in Network Menu, **Press the Right Arrow Button** **until "1/2 BACnet Network"** screen is displayed.

Step 4 In 1/2 BACnet Network screen, **set the desired MS/TP network address**.

1. Press to select MS/TP Address.

2. Press Down Arrow until desired address is displayed for COM address. You may press and hold button to scroll number more quickly.

NOTE: MS/TP Network will not be enabled until the address is changed from default address 254.

Step 5 **Press the Right Arrow Button** until **"2/2 BACnet Network"** screen is displayed.

Default BACnet instance number is generated by the model number and COM address of controller. For example, the instance of MS8350 with COM address 57 is generated as "83057".

1. Use the number buttons to enter your desired BACnet Instance number.

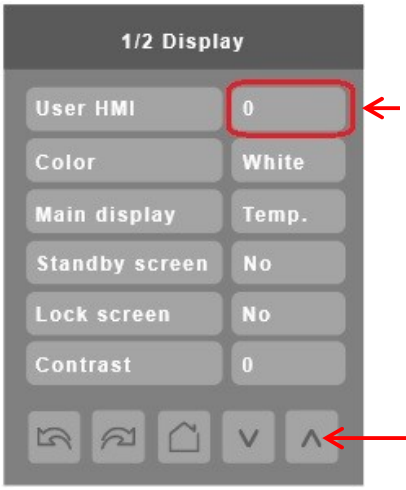
2. Press the check mark button to accept and save the Instance number.

NOTE: Press the Reset Button to reset instance number to default.

Display

Step 1 Within Setup Screen 1/2, select "**Display**".

Step 2 In the 1/2 Display screen, **set User HMI to "7"**.



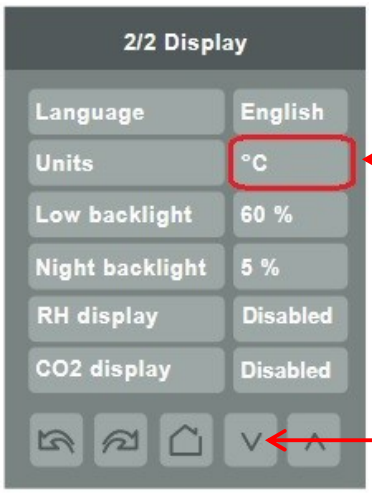
1. Press to select User HMI.

2. Press Up Arrow until **"7"** is displayed for User HMI.

NOTE: User HMI 7 removes the language set button from the main home display. Removing this button will prevent accidental language changes.

Step 3 While in Display Menu, **Press the Right Arrow Button** until "**2/2 Display**" screen is displayed.

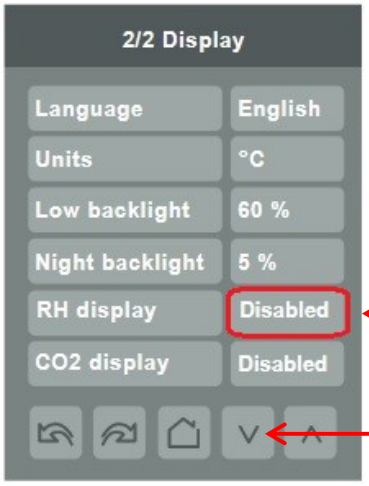
Step 4 In the 2/2 Display screen, **set Units to "°F"**.



1. Press to select Units.

2. Press Down Arrow until **"°F"** is displayed for Units.

Step 5 In the 2/2 Display screen, **set RH display "Enabled"**.



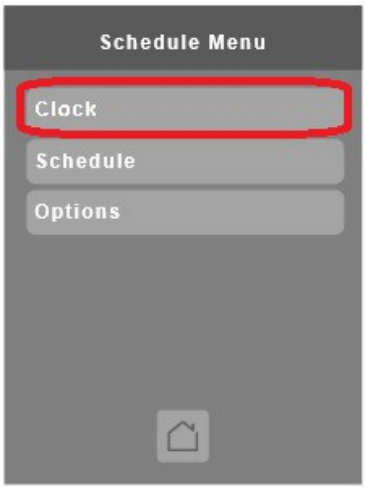
1. Press to select RH display.

2. Press Down Arrow until **"Enabled"** is displayed for RH display.

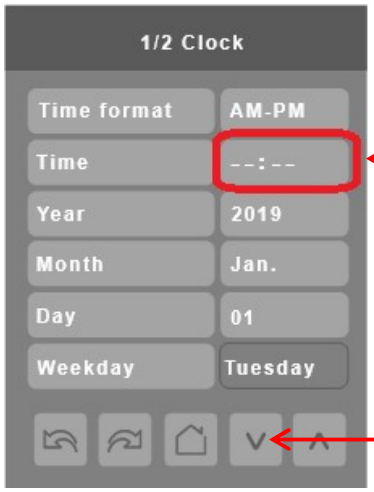
Clock

Step 1 Within Setup Screen 2/2, select "**Clock - Schedule**".

Step 2 Within Schedule menu, select "**Clock**".



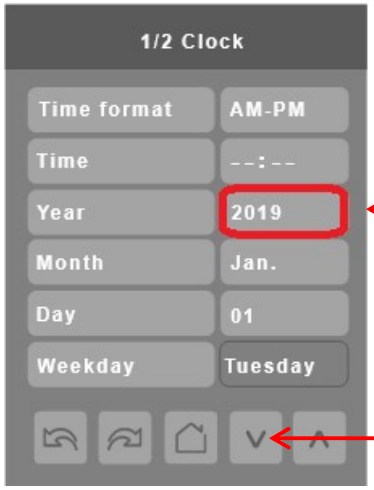
Step 3 In the 1/2 Clock screen, **set current Time**.



1. Press to set Time.

2. Press Down Arrow until current Time is displayed.

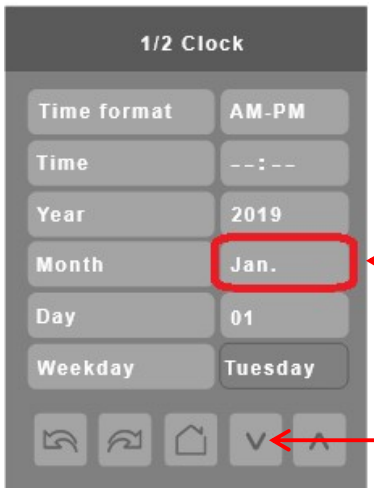
Step 4 In the 1/2 Clock screen, **set current Year**.



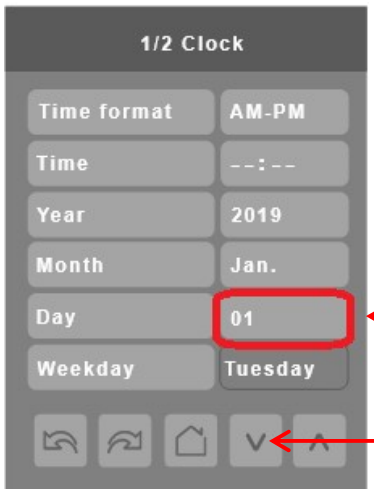
1. Press to set Year.

2. Press Down Arrow until current Year is displayed.

Step 5 In the 1/2 Clock screen, **set current Month**.



Step 6 In the 1/2 Clock screen, **set current Day**.

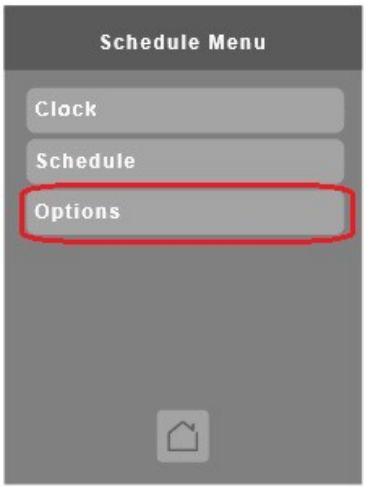


NOTE: Weekday is read only. It will update based on the entered date.

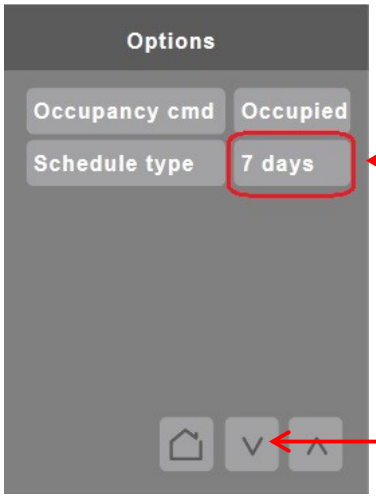
Schedule

Step 1 Within Setup Screen 2/2, select "**Clock - Schedule**".

Step 2 Within Schedule Menu, select "**Options**".



Step 3 In the Options screen, **set Schedule Type to "7 days"**.

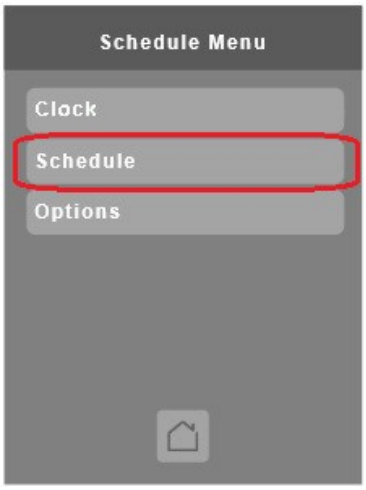


1. Press to set Schedule type.

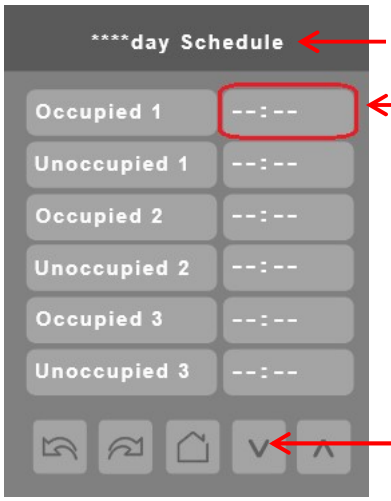
2. Press Down Arrow until "**7 days**" is displayed.

NOTE: The schedule type "7 days" accommodates BACnet schedule export with MultiSITE Supervisor.

Step 4 Within the Schedule Menu, **select "Schedule"**.



Step 5 Within the Weekday Schedule menu, **select Occupied 1**.



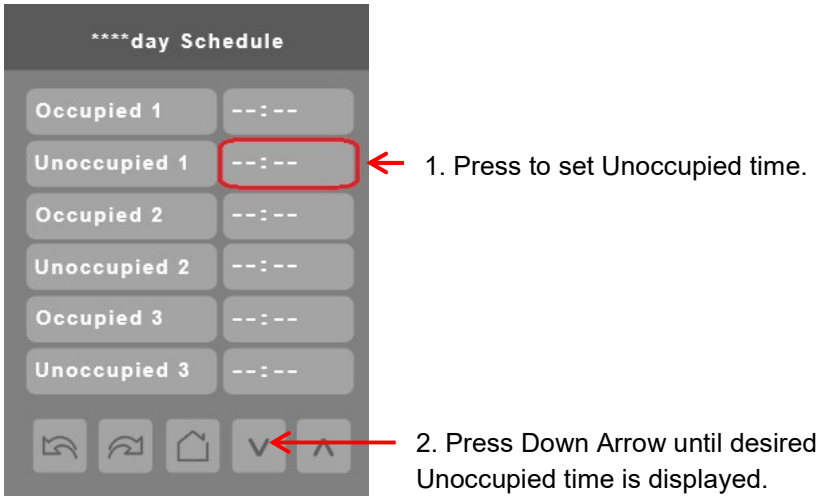
Identified by day of the week (Sunday through Saturday)

1. Press to set Occupied time.

2. Press Down Arrow until desired Occupied time is displayed.

NOTE: The schedule type "5+2 days" will display either "Weekdays Schedule" or "Weekend Schedule" at the top. Schedule type "7 days" will display each day of the week. If you wish to have more than one Occupied/Unoccupied time, you may use Occupied/Unoccupied 2 and Occupied/Unoccupied 3.

Step 6 Within the Weekday Schedule menu, **select Unoccupied 1**.

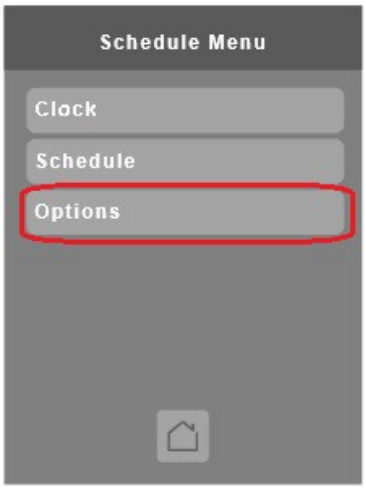


Step 7 While in Weekday Schedule Menu, **Press the Right Arrow Button** to **view each weekday schedule**. Edit each weekday schedule as described in steps 5 and 6 above.

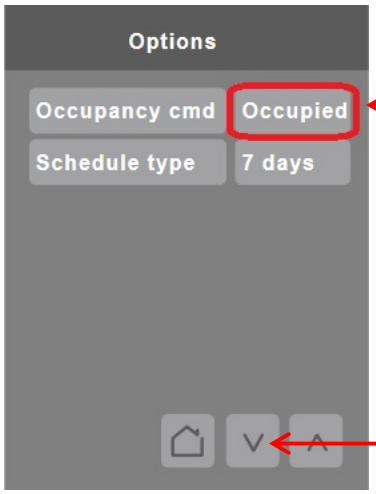
Occupancy Command

Step 1 Within Setup Screen 2/2, select "**Clock - Schedule**".

Step 2 Within Schedule Menu, select "**Options**".



Step 3 Within Options Menu, select "**Occupancy cmd**".



1. Press to set Occupancy cmd.

2. Press Down Arrow until "**Loc occ.**" is displayed.

NOTE: Occupancy command "Loc. Occ." setting allows Stand-by mode using PIR sensor to function. Occupancy command "Schedule" will ignore PIR sensor function.

Configuration

Step 1 Within Setup Screen 1/2, select "**Configuration**".

Step 2 In Configuration 1/9, set **Occupancy src to** "**Mot. Occ**" (Motion and Occupied).

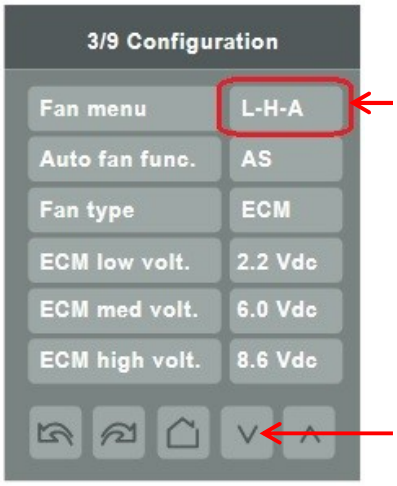
1. Press to select Occupancy source.

2. Press Down Arrow until **Mot. Occ.** is displayed for Occupancy source.

NOTE: Occupancy source "Mot. Occ." setting allows Stand-by using PIR sensor to function. Occupancy source "Schedule" will ignore PIR sensor function.

Step 3 While in Configuration Menu, **Press the Right Arrow Button**  until "**3/9 Configuration**" screen is displayed.

Step 4 In 3/9 Configuration screen, **set Fan menu to "L-M-H-A"**.



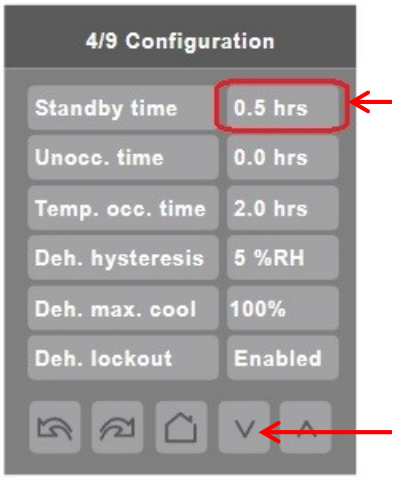
1. Press to select Fan menu.

2. Press Down Arrow until "**L-M-H-A**" is displayed for Fan menu.

NOTE: The selected fan sequence in this menu dictates the Fan button options displayed on the Home screen of the room controller.

Step 5 While in Configuration Menu, **Press the Right Arrow Button** until "**4/9 Configuration**" screen is displayed.

Step 6 In 4/9 Configuration screen, **set Standby Time**.



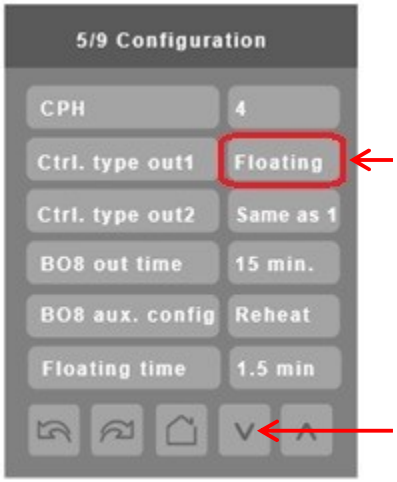
1. Press to select Standby time.

2. Press Down Arrow until desired standby time is displayed.

NOTE: Standby time is the time between the moment where the PIR cover detects last movement in the area, and the time which the Room Controller standby setpoints become active.

Step 7 While in Configuration Menu, **Press the Right Arrow Button** until "**5/9 Configuration**" screen is displayed.

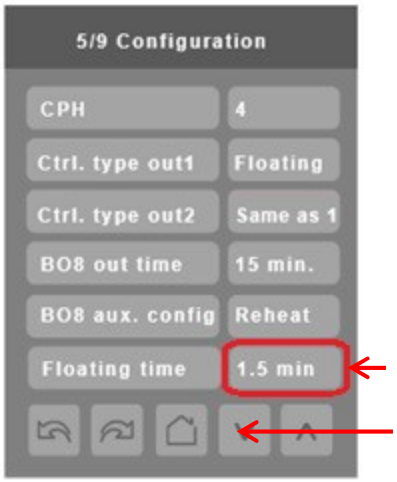
Step 8 In 5/9 Configuration screen, **set Ctrl type out1 to "Floating"**.



1. Press to select Ctrl type out1.

2. Press Down Arrow until "**Floating**" is displayed.

Step 9 In 5/9 Configuration screen, **set Floating time**.



1. Press to select Floating time.

2. Press Down Arrow until desired Floating time is displayed.

IMPORTANT: Floating time is the time maximum stroke time for floating valve actuator. This value must be set per the valve actuator specification typically found printed on the actuator motor cover. If this value is not set correctly, valve position will not be controlled correctly and damage to actuator motor may occur.

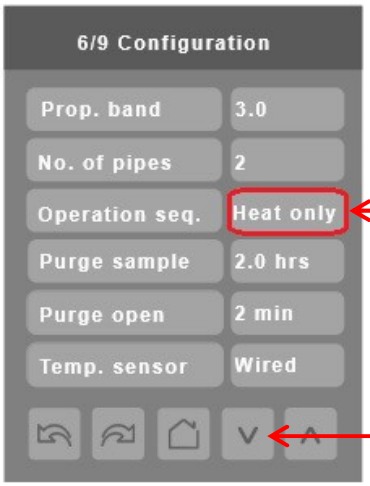
Step 10 While in Configuration Menu, **Press the Right Arrow Button**  until "**6/9 Configuration**" screen is displayed.

Step 11 In 6/9 Configuration screen, **set No. of pipes to "4"**.

1. Press to select Number of Pipes.

2. Press Down Arrow until "**4**" is displayed.

Step 12 In 6/9 Configuration screen, **set Operation seq. to "Cool/Heat"**.



1. Press to select Operation Sequence.

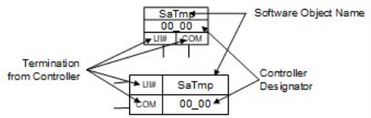
2. Press Down Arrow until "**Cool/Heat**" is displayed.

Appendix

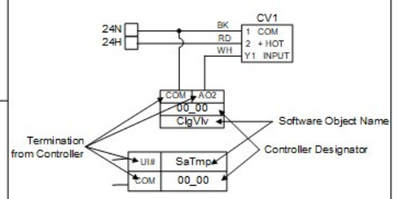
Control Schematic Legend

Symbol Legend

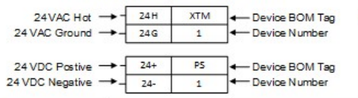
Input/Output Blocks

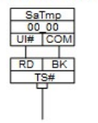
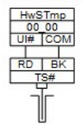
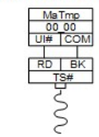
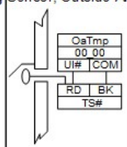
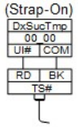
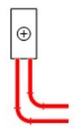
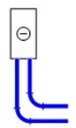
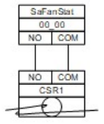
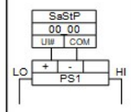
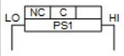
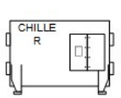
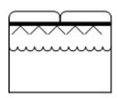
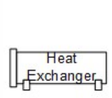
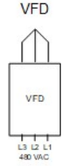
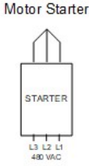
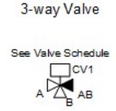
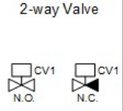
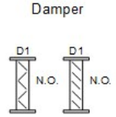


Damper or Valve Actuator



Transformer/Power Supply Blocks



Temperature Sensor, Duct Probe	Temperature Sensor, Immersion	Temperature Sensor, Averaging	Temperature Sensor, Outside Air	Temperature Sensor, Room	Temperature Sensor, Bulb (Strap-On)
					
Hydronic Heating Coil	Hydronic Cooling Coil	Gas Heating	Current Sensor	Pressure Sensor	Pressure Switch
					
DX Cooling 1 Stage	HeatPump or Dual Pipe Coil	Electric Heating	Smoke Detector	Transformer	Filter
					
Chiller	Boiler	Cooling Tower	Pump	Heat Exchanger	....
					
VFD	Motor Starter	3-way Valve	2-way Valve	Fan	Damper
					

Floor Plan Legend is independent, please refer to Legend on that Page

General Notes

1. All room thermostats/sensors/controllers shall be installed at 60" above fixed floor for ADD compliance for new installations. For replacement of existing devices, leave sufficient rolled coil of wire above the ceiling should the device need to be moved down to meet this requirement in the future.

2. All sensor or thermostat pulls that are new require 1 extra conductor to be pulled as well for future use. The shield/drain is not suitable for a conductor.

3. All panel keys will be collected daily and removed from the panels installed. These keys are to be giving to the Energy Solutions Site Supervisor.

4. All thermowells shall be filled with heat conductive compound that is provided.

5. Wiring Terminations designated as 'X' or 'XX' indicate information was unavailable at time of submittal. Please inform Schneider Electric before making field terminations.

6. Remote control devices, not in local panels, shall be accessible for adjustment and service - below 7' above fixed floor whenever possible or as shown on the provided Construction prints.

8. All new BAS controller panels shall have a dedicated 120Vac power source. This source shall be located and marked in the electrical panel as well as on the control prints returned for Record prints.

9. Installer responsible for maintaining existing safeties into new BAS control – electrically or pnuematically connected.

Detail Name

Color	3-Letter	2-Letter	1-Letter
Black	BLK	BK	b
Brown	BRN	BR	n
Red	RED	RD	r
Orange	ORG	OR	o
Yellow	YEL	YL	y
Green	GRN	GN	g
Blue	BLU	BU	u
Violet	VIO	VL	v
Gray	GRY	GY	a
White	WHT	WH	w
Gold	GLD	GL	d
Silver	SLV	SV	s
Pink	PNK	PK	p

1-Letter abbreviations used for color of stripe on wire. (WH/o = White wire with orange stripe)

Wiring Legend

Low Voltage (50 volts or less) control wiring for inputs and outputs shall be 18 AWG or larger rated for 600-volt service. Terminate any shields or drains for input/outputs at the controller only.

Indicates need for conduit to be ran by installer. Distances noted on plans are approximate values.

Cat5 Ethernet

Ethernet Wiring: Network cable shall meet or exceed all requirements of Category 5 cable as specified in ANSI/TIA/EAI 568-A. No other devices other than stated in these Construction drawings will be added to or removed from the client's Ethernet backbone or WAN.

-MS/TP-

MS/TP BACnet or I/Net Wiring: Wiring to be installed using 24 AWG 7/26 Bare Copper – 2 conductor stranded, 7/32 drain wire, 12.5 pF/ft @ 1 KHz nominal UL TYPE CMP/CL3P 24 AWG. Maximum length is 4000' or 110 controllers. End of Line resistor (120Ω 1/4W) to be installed at both ends of network segments. All communication cabling to be installed in a daisy chain configuration, no T's are permitted. Shield on communication cable is to remain continuous and grounded only at a controller. Polarity of the wires must be observed. Splicing of communication cable is not permitted.

-FTT-10-

LON or FFT-10 Wiring to be installed using Level IV network cable. Level IV network cable is 22 AWG 7/30 Bare Copper, 2 conductor stranded, with or without a 7/32 drain wire, 17 pF/ft, and impedance of 100 ohm (1-20MHz) nominal UL TYPE SUBJECT 444, CMP. The same cable shall be used through out the project to avoid impedance issues. Maximum length is 4600' or 55 controllers without use of repeater. Terminator to be installed at both ends of network segments. All LON/FFT-10 cabling to be installed in a daisy chain configuration (not FTT-10A). This cable is not to run in the same conduit with power for more than 5'. Splicing of communication cable is not permitted.

LG

Revisions
Date:
Change:
#:

Architect: NA
Engineer: NA
Contractor: NA
Designed by: GCM Date: 5/26/2020
Software by: Date:
Checked by: Date:

MS8350 4 Pipe FCU App Guide
4300 North Point Parkway
Alpharetta, GA 30022
Legend

JOB NUMBER
FILE NAME Legend.vsd
SHEET NO. 1 OF 2

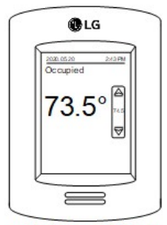
Control Schematic Flow Diagram, Wiring, Sequence of Operation, Bill of Material

3rd Party Device

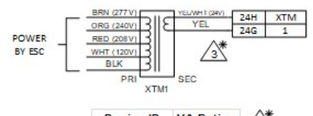
Device	Qty	Part Number	Description	Manufacturer
XTM1	1	TR40VA004	277/240/208/120:24 VAC Transfo	Functional Devices

LG Device

Device	Qty	Part Number	Description	Manufacturer
MS8350-1	1	VUCQMS8350	MultiSITE Controller MS8350	LG



LG MS8350 ROOM CONTROLLER
MOUNTED ON WALL IN ZONE SERVED BY FCU
SEE WIRING DETAIL BELOW

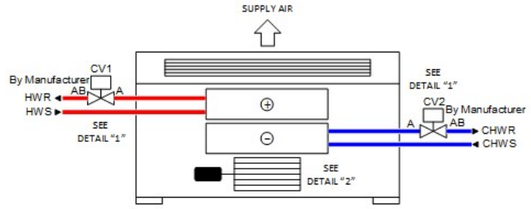


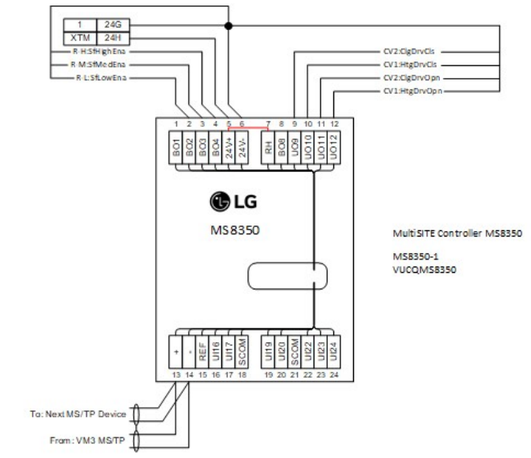
Device ID	VA Rating
MS8350-1	6
CV1	7
CV2	7
R-L, R-M, R-H	1
Total	21

4

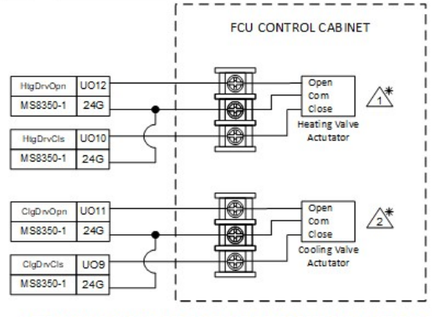
Four Pipe Vertical Fan Coil Unit

Fan Coil with Floating Control Heating/Cooling Valves
MS8350 Controller



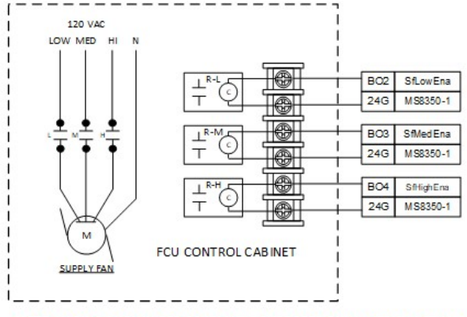


1 Floating Control Valve Actuator Wiring Detail



NOTE: WIRING SHOWN FOR SCHEMATIC PURPOSES ONLY. VERIFY ACTUAL TERMINATIONS PER EQUIPMENT MANUFACTURER WIRING DIGARAM

2 3 Speed Fan Wiring Detail



NOTE: WIRING SHOWN FOR SCHEMATIC PURPOSES ONLY. VERIFY ACTUAL TERMINATIONS PER EQUIPMENT MANUFACTURER WIRING DIGARAM

Sequence of Operation

Occupied Mode
Setpoints revert to those defined by occupied cooling and heating.

Stand-by Mode (only available when PIR motion detector sensor is used)
Setpoints revert to those defined by stand-by cooling and heating setpoints after standby timer has passed.

Unoccupied Mode
Setpoints revert to those defined by unoccupied heating and cooling.

Occupied Override Mode
System reverts to occupied mode for duration determined by "ToccTime" parameter.

On Call for Cool
Cooling valve opens to maintain room temperature. Heating valve closes.

On Call for Heat
Heating valve opens to maintain room temperature. Cooling valve closes.

On Demand for Dehumidifiction
Dehumidification is achieved via cooling coil using heating coil for reheat if necessary.

Dehumidification is only allowed in COOL mode, or if cooling is enabled in AUTO mode.

Dehumidification is disabled if room temperature falls below low ambient lockout temperature, which is the cooling setpoint minus the configuration defined deadband value.

Reheat disabled if cooling demand reaches 100%.

Note: Dehumidification with reheat will only be effective if reheat coil is located downstream (after) cooling coil. Else room conditions may result in cold and damp condition.

3 Speed Fan Operation (Fan Modes)
When the system is Off, the fan shall not be energized.

When the system is On:
- Low: Low fan speed enabled
- Med: Medium fan speed enabled
- High: High fan speed enabled
- Auto: When there is no demand, fan is low speed. On demand, system will automatically switch "on" low, medium, or high speed.

1 Wiring for Normally Open hot water actuator shown. If actuator is Normally Closed, wire to MS8350 UO10

2 Wiring for Normally Closed chilled water actuator shown. If actuator is Normally Open, wire to MS8350 UO11

3 Field supplied transformer shown for schematic purposes only. If 24VAC transformer is supplied with equipment, use OEM supplied transformer.

4 Power consumption (VA) of all devices must be calculated and appropriately sized transformer used. This example shows estimated power consumption (VA) for two position zone valves with spring return action.

LG

Revisions
| Change: | Date:

JOB NUMBER | MS8350 4 Pipe FCU App Guide | 4300 North Point Parkway | Alpharetta, GA 30022 | MS8350 4-Pipe FCU 3 Spd Fan
FILE NAME
SHEET NO. 2 OF 2

Architect: NA
Engineer: NA
Contractor: NA
Designed by: GCM Date: 5/26/2020
Software by: Date:
Checked by: Date: