Doyle Labs Air Handing Control Software Instructions

NRH, 11-2008

Accessing the Main Control Interface

1. Go to https://uosops.bms.uos.harvard.edu
   a. If this is your first time visiting, click "Click here to obtain the client software"
   b. Download and install the Citrix software
   c. Go back to the webpage and indicate the successful installation
2. Type your username and password to access the system
   a. If using Safari/Mac, you may get some errors about encryption that may prevent you from logging in. Try logging in a few times and it should eventually work.
3. Click "Insight" in the Applications Box
4. In the small window titled "Insight" that pops up, click on the "Graphics" square. You can mouse over the squares to get the title of the application they launch, but at the time of this writing "Graphics" is one down and one over from the top-left square.

Navigating the Control Interface

o Double-click on any of the boxes under "Doyle Lab Groups" to access the controls for that specific area.
   o Air Handler 1: Serves the optics tables in Room 24 (the main lab area)
   o Air Handler 2: Serves the Chromium Lab
   o Air Handler 3: Serves the High Bay, but should not be used. Instead use "High Bay Area."
   o LISE Air Handler 5: Serves LISE G14
o When in the controls for a specific area, double-click on a box to bring up controls for that unit. Double-clicking will also give more precise values for readouts, since (a) they include more decimal places, and (b) they are updated more quickly than the values on the main screen.
o Use boxes with the abbreviation STPT (setpoint) to change values.

Exiting the Program

It is important to exit the program properly; otherwise you might not get logged out. In Windows, right click in the small "Insight" window (where you clicked "Graphics") and go to "Exit Insight." In Mac, click on "Citrix ICA Client" on the top menu bar, and then select quit. Note that in both cases you should get some prompt confirming that you want to exit Insight. If you do not get this prompt, you may still be logged in.
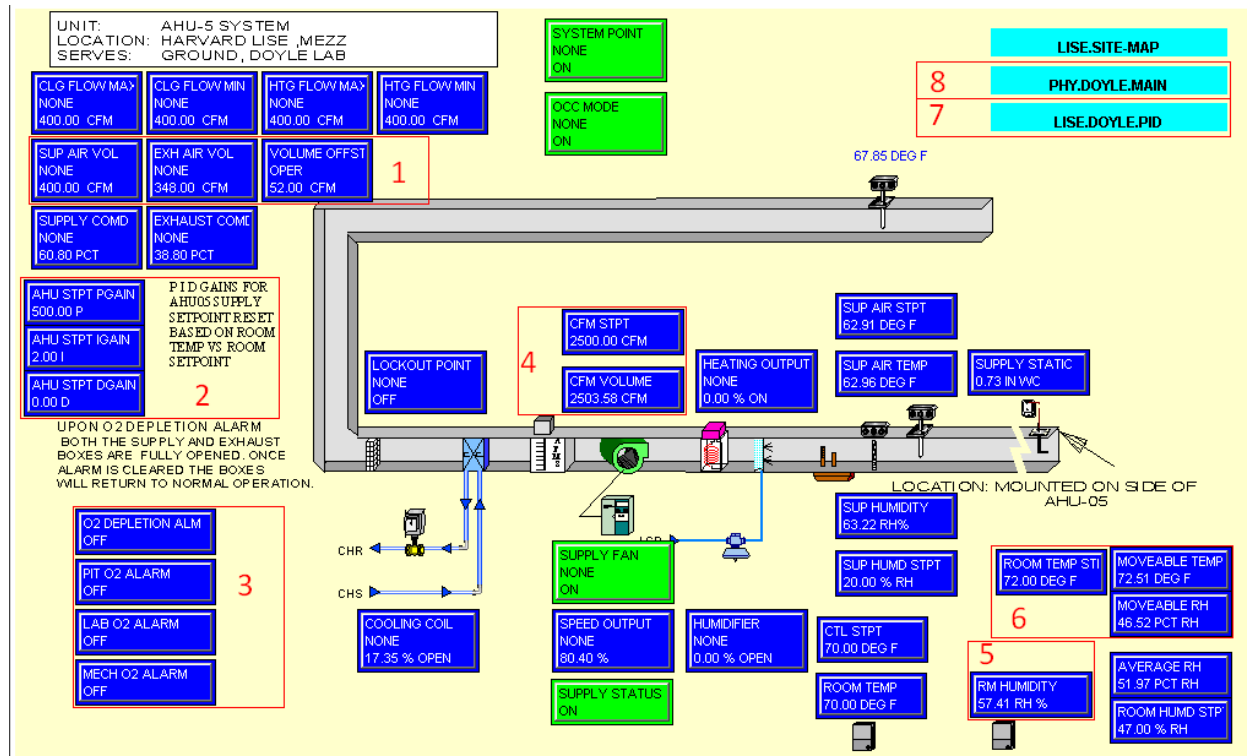
Figure 1: Overview of the LISE Air handling system. The red boxes and numbers are added for reference.

1. These boxes control the fresh air supply (SUP AIR VOL) and exhaust (EXH AIR VOL). The offset is the difference between the supply and exhaust. Changing the offset will result in the exhaust volume changing but the supply volume staying fixed.
2. PID parameters for the air handler. All PID values (these included) can be edited by clicking #7.
3. Oxygen sensors. PIT is above the pit, LAB is the other sensor in G14, and MECH is in G16. OFF means that the sensors are reading a safe level. If one of the sensors is tripped, it will change to ON and set the fresh air supply and exhaust to maximum value until the oxygen reaches a safe level.
4. Flow setpoint and reading for air circulated within the room. Note that this is not fresh air.
5. Relative humidity readout located near the G16 door.
6. Room temperature setpoint, and temperature/relative humidity readouts located on the movable sensor that is (at the time of writing) located near the wall opposite the G16 door.
7. PID values for the heating and cooling systems.   See separate section about this module.
8. Return to the main Doyle Labs interface

LISE.DOYLE.PID Controls

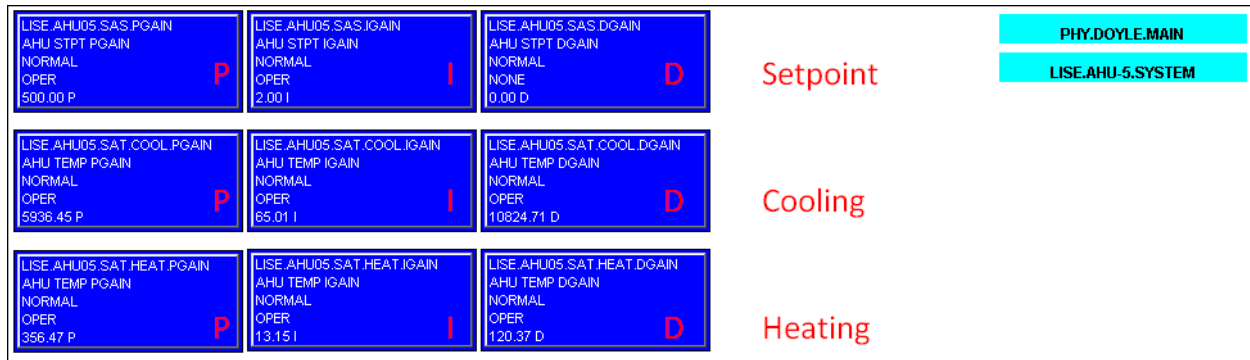| LISE.AHU05.SAS.PGAIN
AHU STPT PGAIN
NORMAL
OPER
500.00 P | **P** | LISE.AHU05.SAS.IGAIN
AHU STPT IGAIN
NORMAL
OPER
2.00 I | **I** | LISE.AHU05.SAS.DGAIN
AHU STPT DGAIN
NORMAL
NONE
0.00 D | **D** | Setpoint |
| LISE.AHU05.SAT.COOL.PGAIN
AHU TEMP PGAIN
NORMAL
OPER
5936.45 P | **P** | LISE.AHU05.SAT.COOL.IGAIN
AHU TEMP IGAIN
NORMAL
OPER
65.01 I | **I** | LISE.AHU05.SAT.COOL.DGAIN
AHU TEMP DGAIN
NORMAL
OPER
10824.71 D | **D** | Cooling |
| LISE.AHU05.SAT.HEAT.PGAIN
AHU TEMP PGAIN
NORMAL
OPER
356.47 P | **P** | LISE.AHU05.SAT.HEAT.IGAIN
AHU TEMP IGAIN
NORMAL
OPER
13.15 I | **I** | LISE.AHU05.SAT.HEAT.DGAIN
AHU TEMP DGAIN
NORMAL
OPER
120.37 D | **D** | Heating |

Figure 2: LISE Temperature PID controls. Red text is added for reference.

There are three different PID loops to control the temperature .

The setpoint (STPT) loop resets the discharge temperature setpoint of AHU-5. It references the moveable temperature sensor versus the room temperature setpoint (see item #6 on the LISE Air Handler page). As room temperature drops below room setpoint the discharge temperature setpoint for AHU-5 will increase, etc.

The heating (HEAT) and cooling (COOL) loops maintain AHU-5 discharge temperature setpoint as reset by room temperature (see above). When the AHU switches to cooling mode the cooling loop will modulate the chilled water valve to maintain temperature. When the AHU switches to heating mode the heating loop will modulate the electric heating coil to maintain temperature. When one loop is operating the other device will be closed or off respectively.

At the time of writing, the parameters for each loop are:

        STPT: P = 500.00   I = 2.00   D = 0.00

        COOL: P = 5936.45   I = 65.01   D = 10824.71

        HEAT: P = 356.47   I = 13.15   D = 120.37

Use the buttons at the top-right of the screen to return to the LISE control window (LISE.AHU-5.SYSTEM) or the main Doyle Labs interface (PHY.DOYLE.MAIN)