

PROLON INSTALLATION AND START UP GUIDE

Part 1: Project preparation & cabling

-----	1	Room sensor	CAT5e network cable with RJ45 connectors (Digital sensor) - OR - #18/4 LVT standard (Analog sensor)
—	2	Supply/Outputs	#18/2 or #18/3 wire, LVT standard
- - - - -	3	Network	#24/2 wire, twisted and shielded, low capacitance ('LOW-CAP') Prolon model PL-MBN
- - - - -	4	Unit sensors	#18/2 ou #18/3 wire, twisted and shielded, such as Cerco #8210/#8211
- - - - -	5	Wire to unit	#18/8 (or #18/10) wire, LVT standard

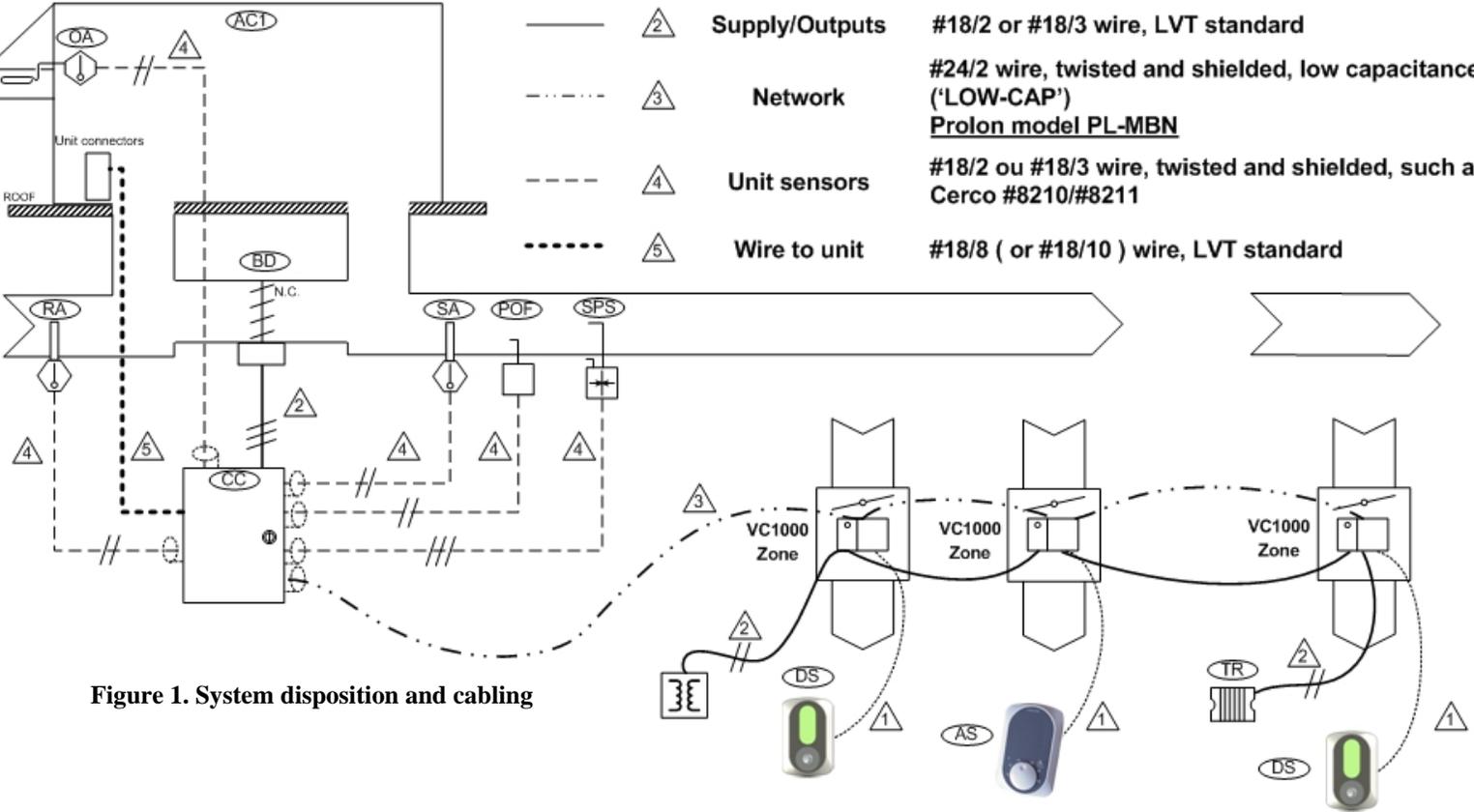


Figure 1. System disposition and cabling

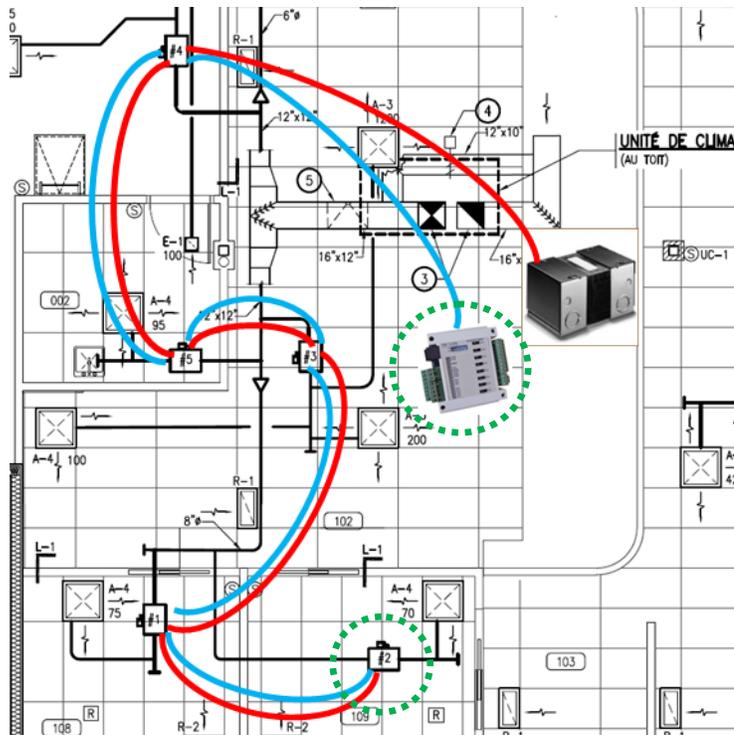


Figure 2. Wiring the zones in a network

1- Using a floor plan, determine the system's zone controller locations as well as the unit controller's (control panel) location
- Mark them on your plans for later access.

2- The controllers must be **addressed** but their location and address in the network are not important.

3- As a result, determine the shortest path for the network cables as well as the supply cables which connect the controllers together.

4- Once the network path has been determined, **Identify the two controllers that will be at each extremity of the network.** Mark them on your plans.

PART 2 : Installing the components

VAV Zone Controller



Figure 3. PL-VC1000 VAV Zone Controller

- Verify / validate the rotation direction of each zone damper
- Install the zone controller on the damper and set in place with screw. **DO NOT OVERTIGHTEN!**
- While pressing the actuator's clutch, the damper should turn freely (a slight off axis movement)
- Adjust mechanical stoppers on actuator to match the full rotation of the damper
- Get the identification address of each zone and write it down inside the cover (or the back plate) of its' zone thermostat (very convenient for service calls)

Sensors and accessories



PL-RS

Room sensor: install 60in from the floor.
Avoid sunny or outdoor walls, diffusers and return grills.
Beware of electrical boxes (lit dimmers, rheostats)!



PL-OAS

Outside air temperature sensor: install under air inlet hood or on the unit's north side
IN THE SHADE!!!



PL-DS

Supply air temperature sensor: install after the bypass damper junction
Return air temperature sensor: install between the bypass damper and the unit's air inlet
(no turbulence)



DPT2650

Static pressure sensor: install 2/3rds of the main ventilation duct's length



PL-FS

Proof of fan (flow switch): Install near the supply air temperature sensor (no turbulence). Plug the high pressure (+) Pitot tube in the air duct. Remove the low pressure cap and leave free.



CO2

CO2 Sensor: Install in the return duct before the bypass junction.



xMB24-SR

Bypass damper actuator: Mark the damper position on the shaft and validate its rotating direction.

Part 3 : Electrical installation / Connections

VAV Zone Controller

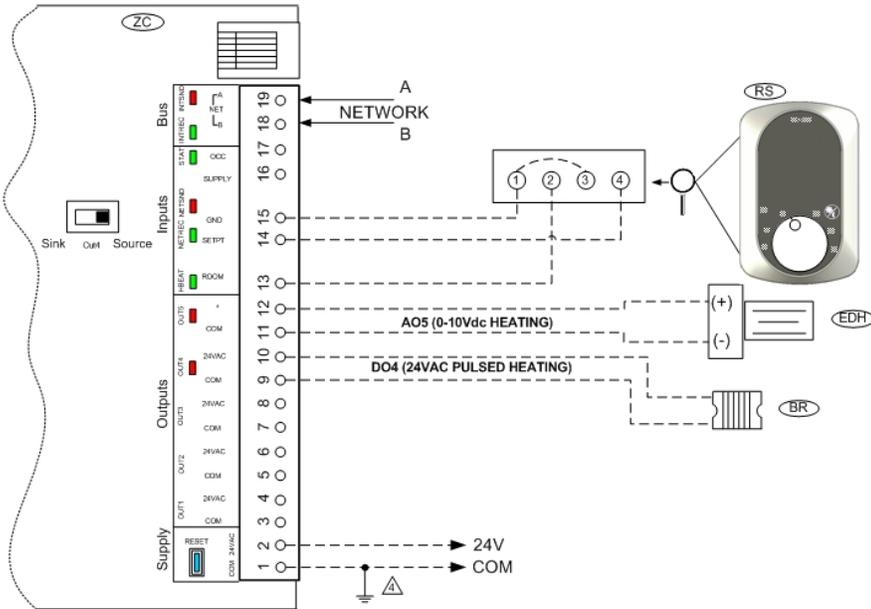


Figure 4. Input/output wiring for a VC-1000 LIGHT

Inputs

- **Analog sensor (PL-RS):** #3/18 cable connected to terminals 13-14-15
- **Digital sensor (PL-T1000):** CAT5e cable with RJ45 connectors
- **Changeover sensor (optional):** connect directly to terminals 15-16

Supply

- 5 VA per zone / max 100VA per circuit
- Link the **1-2** terminals in a daisy chain
- Respect the live / common on all **controllers**
- **Ground the common (at central transformer)**
- Metallic ground all the controllers' commons. (multiple transformers)

Outputs

- **Analog output (0-10Vdc):** connect terminals 11 (-) and 12(+). Respect the polarities.
- Digital output(s) (24Vac or dry contact): determine the switch position according to the controlled device. Respect the polarities ('Source' position)



Figure 5. Dry contact output PASSIVE ('SINK')



Figure 6. 24Vac output ACTIVE ('SOURCE')

Network cabling

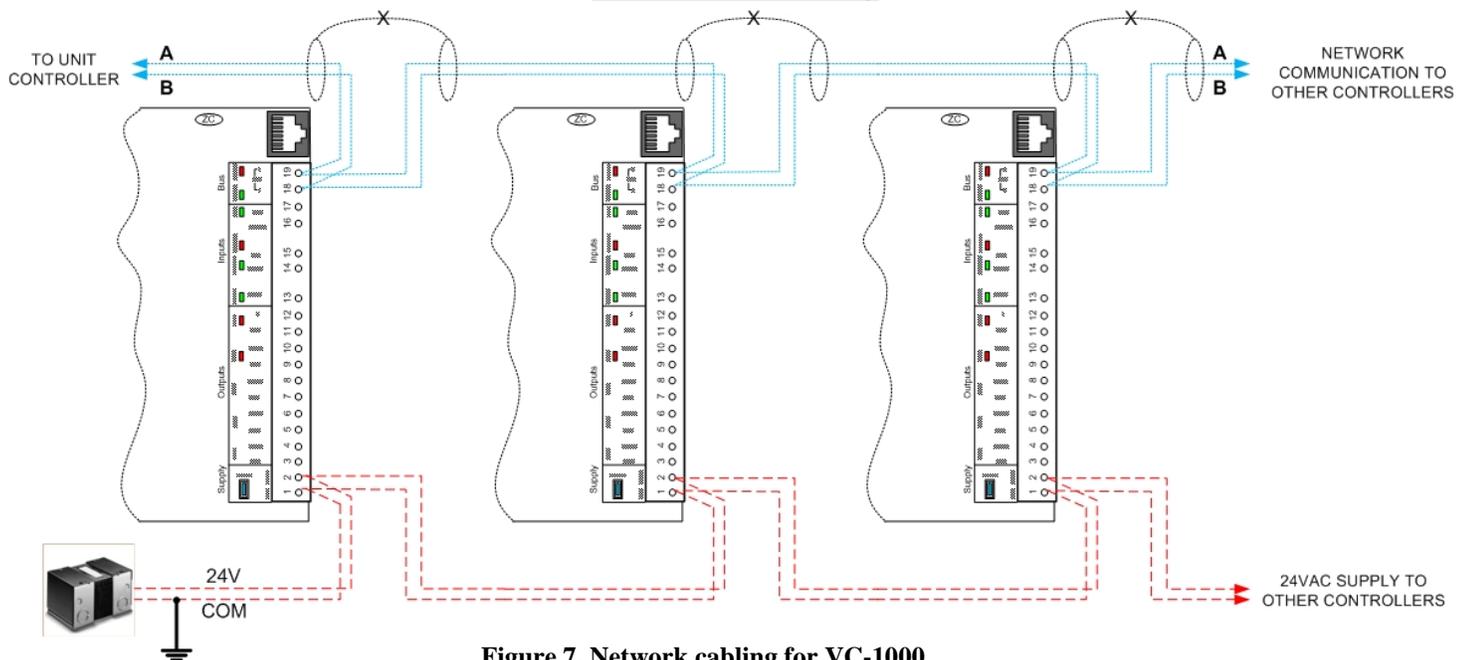
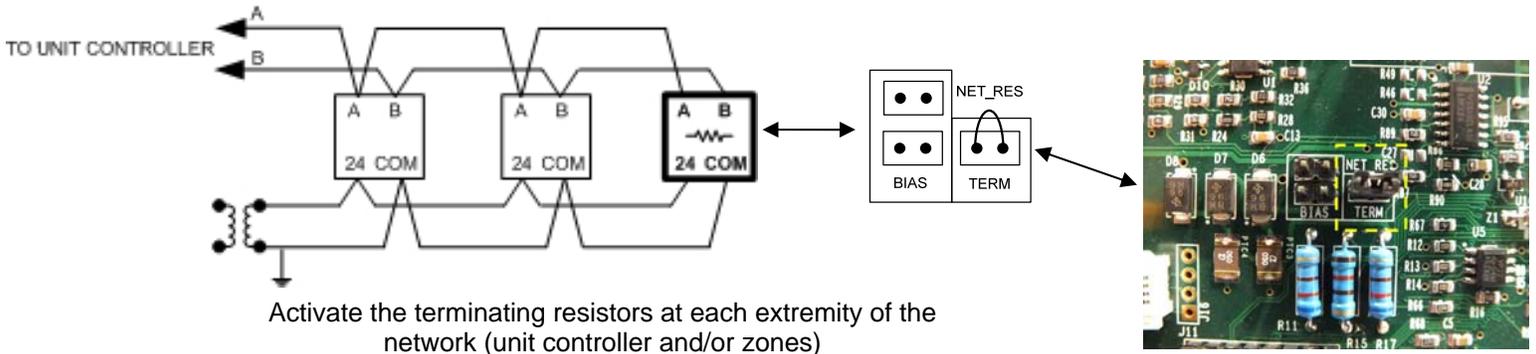


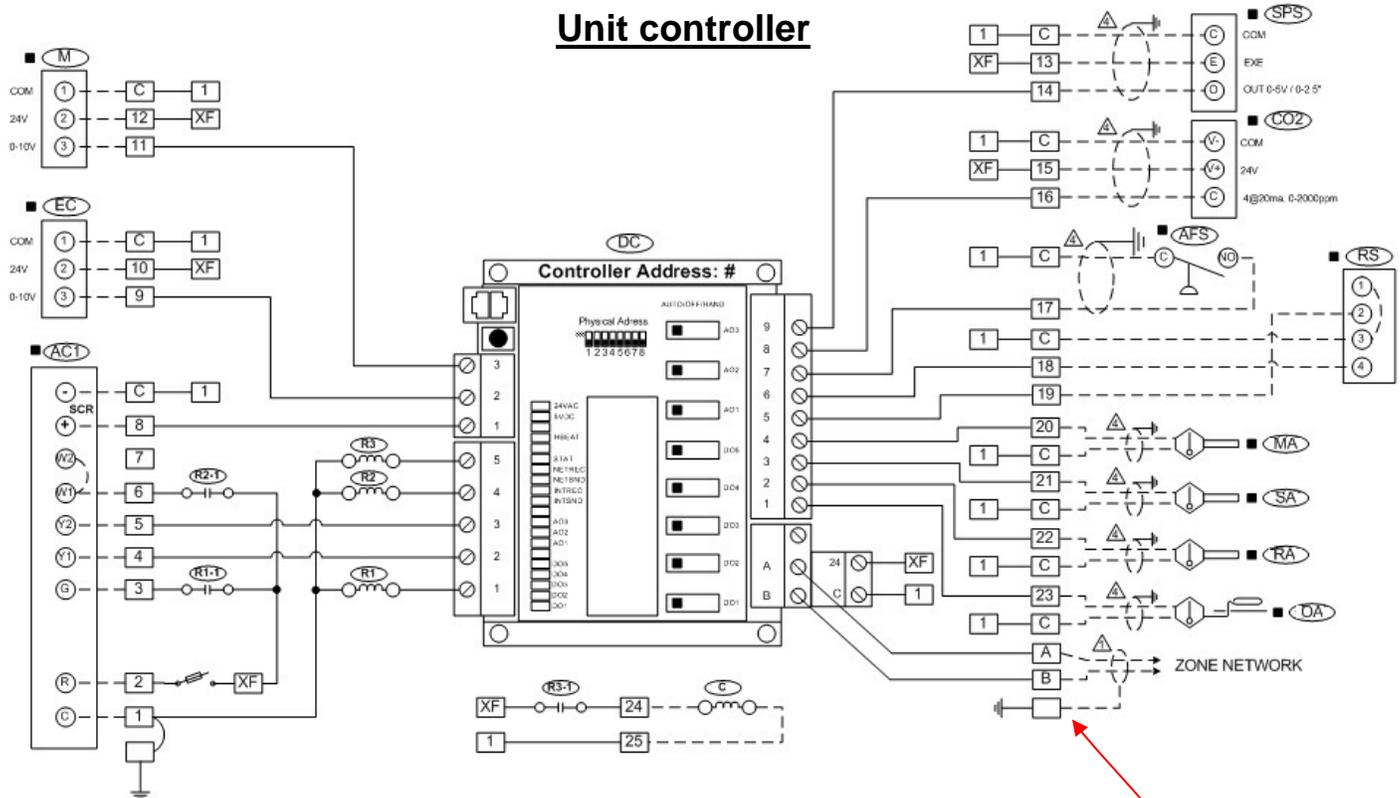
Figure 7. Network cabling for VC-1000

Network cabling (continued)



- Check for continuous daisy-chain to all zone controllers. **Do not link in a star pattern.**
- Check the A / B network polarity on all zones / must all be in phase.
- Join all shields at each controller's junction and connect one end only to the **ground lug in the central panel only.**
- Check / activate terminating resistor jumpers ("TERM") on each of the controls located at both ends of the communication network.
- ProLon PL-MBN cable shielded and twisted. 2 conductor AWG #24, low capacitance only.**

-FASTEN YOUR WIRES TOGETHER AND SECURE THEM TO THE BOX! (TIE-WRAPS, RIBBONS, ETC)



- Check that all (input and output) connections match that of the supplied wiring diagram.
- Check that all shielded cables have their shield grounded at the central panel's ground lug.
- Check that the multi-conductor control cable to the unit is connected and 24vac is available.
- The control panel's 24vac power is fed by the RTU.**
- Never connect temperature or other sensors using spare conductors of AC carrying control cable, as this might cause magnetic interference and lead to erratic data reading. Sensors must use dedicated shielded wiring.

Part 4: Start up

Powering up the zones

- Check if all terminating resistor jumpers are in place (both ends of the communication loop)
- Power up the zones' supply transformer(s)
- Make sure that each controller displays it's flashing green "heartbeat" light
- If zone controllers are supplied with digital sensors, (PL-T1000), make sure the sensor display lights up and shows ambient temperature

Powering up the Unit Controller

- The air handling unit (or RTU) must be on, as it supplies 24vac power to the unit controller
- Power up the controller by closing fused switch (located in the control cabinet)
- Check that the controller lights up both power indicators (red) 24vac and 5vdc
- Check that the controller displays it's red blinking heartbeat (written: hbeat)
- Approximately ten seconds after powering up, check the network communication status lights "NETREC" and "NETSND" on the controller. They should briefly blink together, every three seconds or so, to confirm communication is established with the zones

-Inspect all zone controllers as well, making sure the same status lights (NETSND in red and NETREC in green) also blink at the same rate as the unit controller

-About **15 seconds** following power up, the unit controller should start the ventilation (output DO1 activated)

-Approximately **5 minutes** following power up, the heat or the air conditioning of the unit can come on (initial power up off-delay protection)

Quick verification (without the Prolon Focus software and computer)

-To verify cooling, each zone ambient temperature must be equal or above the zone's cooling low set point limit (default: 20°C)

-Set all the thermostats to call for cooling

-The Unit controller will activate its cooling output(s) if all limits, protections and delays have been acknowledged

-Check that all zone dampers open for cooling as requested

-To verify heating, each zone ambient temperature must be equal or under the zone's heating high set point limit (25deg. C by default)

-Set all the thermostats to call for heat

-Check for zone terminal heating operation (if applicable)

The Unit controller will activate its heating output(s) if all limits, protections and delays have been acknowledged

-Check that all zone dampers open for heating as requested

Part 5: Prolon Focus (Computer access and control)

Computer and software

-In order to avoid problems and delays, make sure to follow these guidelines

- Use a laptop computer (with Windows XP or later software) as well as the most recent version of **Prolon Focus**. Visit the website www.prolon.net to download the latest version
- If you are using the Prolon RS485 communication interface for the first time, you must install the driver software that comes with it.
- Once installed, you must validate the communication port (COM) number your computer assigned to that interface
- To find out, Go to the Control Panel settings on your computer, then Systems, then on Hardware and finally click on Device Manager. (Start / Control Panel / Hardware / Device Manager). Click on : "Ports COM & LPT", The COM port identified as : "USB Serial Port COMx" or "RS485 Isolated Port COMx" will be the one to use

Opening a session on Prolon Focus

- Connect the communication interface to the computer (USB cable or serial depending on the model)
- Connect the network cable (CAT5e / RJ45 male plug) from the interface output to the communication port of the unit controller in the panel (input RJ45 female jack)
- Open the Focus software by double-clicking on the Prolon icon located on your computer's desktop
- Click on "Create a new project"
- Click on "Serial Connection"
- Select amongst the list the communication port number you previously retrieved
- A message will appear in the bottom left corner of the screen to confirm "**Port COM (x) opened**"

Setting up a new system

- From the left hand list, double click the desired unit controller icon (eg: "Advanced Roof-Top" for an air conditioning with advanced options).
- Enter the identification address (as on the controller, also determined by the position of the addressing dip-switches).
- A bright colored icon (green, red or blue) will appear at the top of the screen, symbolizing the unit.
- Move the mouse's cursor and point the icon, right-click on the mouse to browse the command menu.
- Click on "**Get List**", the unit controller will scan its' network and update the list of zones and these zone icons will begin to appear on the screen.
- Validate the list of zones, checking all addresses and making sure they have all shown up, according to the project's shop drawings. If some icons are missing, ensure that the controls are supplied in 24V. Check the connection to the power supply and to the network (those connections are polarized) and also check on the controller card the status of the following blinking LED's: **hbeat**, **netrec** and **netsnd**.
- Confirm that all the zones appear in one of the following three colors according to their particular request: **green**=satisfied, **red**=heating, **blue**=cooling
- Should an icon appear in **grey**, communication is lost to that zone.

Part 5: Prolon Focus (Computer access and control)

Absolute override authorization

- Double-click the unit controller and select the 'CONFIG' menu on the top left corner. Then select 'Config View'.
- At the bottom of this page check the 'Enable Absolute Overrides' and click 'OK' to confirm your acceptance.
- Then click 'Apply'.

Adjusting the bypass damper

- Click on the 'Home' button in the upper right to return to the unit controller's home page, click on 'Network' then 'Other' at the bottom of the list.
- Check the 'Slave Damper Override', enter 100% and click 'Apply'.
- Wait for all the zone dampers to display 100% open on the screen. If this has not been checked before, physically confirm that the dampers are open. If necessary, inverse the zone(s) damper's opening direction (see instructions below)
- Return to the home page and make sure the bypass damper is fully closed (0%). Validate physically.
- Read the static pressure value on the home screen and then adjust the set point by increasing it by 20% of the reading. To do so, click on 'Config' then 'Pressure' to access the pressure management menu for the bypass damper. Adjust the set point according to your calculations and adjust the differential to 20% of the set point value.
Eg: pressure read: 0.20", adjust set point to $(\text{pressure read} + 20\%) = 0.24"$, $0.05"$ = differential
- Return to the 'Slave Damper Override' and enter 25%, click 'Apply'
- Check the bypass damper opening on the home page as well as physically according to the increase in pressure. Inverse the opening direction of the bypass damper if need be.
- Return to the home page, click 'Network' and then 'Other' .Remove the 'Slave Damper Override'. Press 'Apply'.

Cooling and heating operations

- From the home page of the unit controller, point and right-click each item to be checked in order to activate the override mode. You can check the economizer's damper(s) (if applicable), the cooling stage(s), the heating stage(s) and/or the modulating heating output from the unit. Physically check the proper functioning of each of these elements.
- Return to the 'Config View' menu, and remove the absolute overrides and click 'Apply'.

Inversing a zone damper

- To inverse the damper's opening direction, double-click the zone controller icon to open its menu, then double-click directly on the zone damper shown on the screen. You then access the page: 'Damper Configuration'.
- At the bottom of this page, 'Damper Setup', choose the correct opening direction (clockwise or counterclockwise) and then click 'Apply'. Physically confirm.

Part 5: Prolon Focus (Computer access and control)

Date and time

-From the unit controller's home screen, check that the date and time are correct. To modify them, click on 'Edit' and then click 'Copy' to copy the computer's date and time, or manually type the change then click 'OK'.

Schedule

-Also from the unit's home screen, click 'Network' and then 'Schedule' to access the schedule configuration page.

-Double-click the 'ON' line in the 'Monday' column. While the cursor flashes in the middle of this period, type the start the 'occupied' period. Eg: 6 to start the 'occupied' period at 6:00am or 630 for 6:30am.

-Double-click the 'OFF' line in the 'Monday' column. While the cursor flashes in the middle of this period, enter the time to end the 'occupied' period. Eg 16 for 16:00 (4:00pm) or 1745 for 17:45 (5:45pm).

-To copy a schedule, click the day to copy on the 'Copy from' dropdown list and then check the other days which will have the same schedule in the 'Paste to' list. Click 'Paste' and then click 'Apply'.

Rename zones and units

-From the basic system screen, right-click a zone or unit controller's icon, select 'Rename' and type the zone or unit's name and click 'OK'.

Save

-Click on 'File' in the upper left corner. Choose 'Save' or 'Save As...' to save the configuration file (.prl file)

Exit

- Click on 'File' in the upper left corner, choose 'Exit' or click on the **X** in the upper right corner to close Focus.

Advanced Configurations

-Focus provides many other settings to optimize the operation of your systems. However this guide is a quick start guide, we invite you to consult the complete documentation online www.prolon.net