



# INSTALLATION AND STARTUP GUIDE



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PL-TRA-STARTUP-EN



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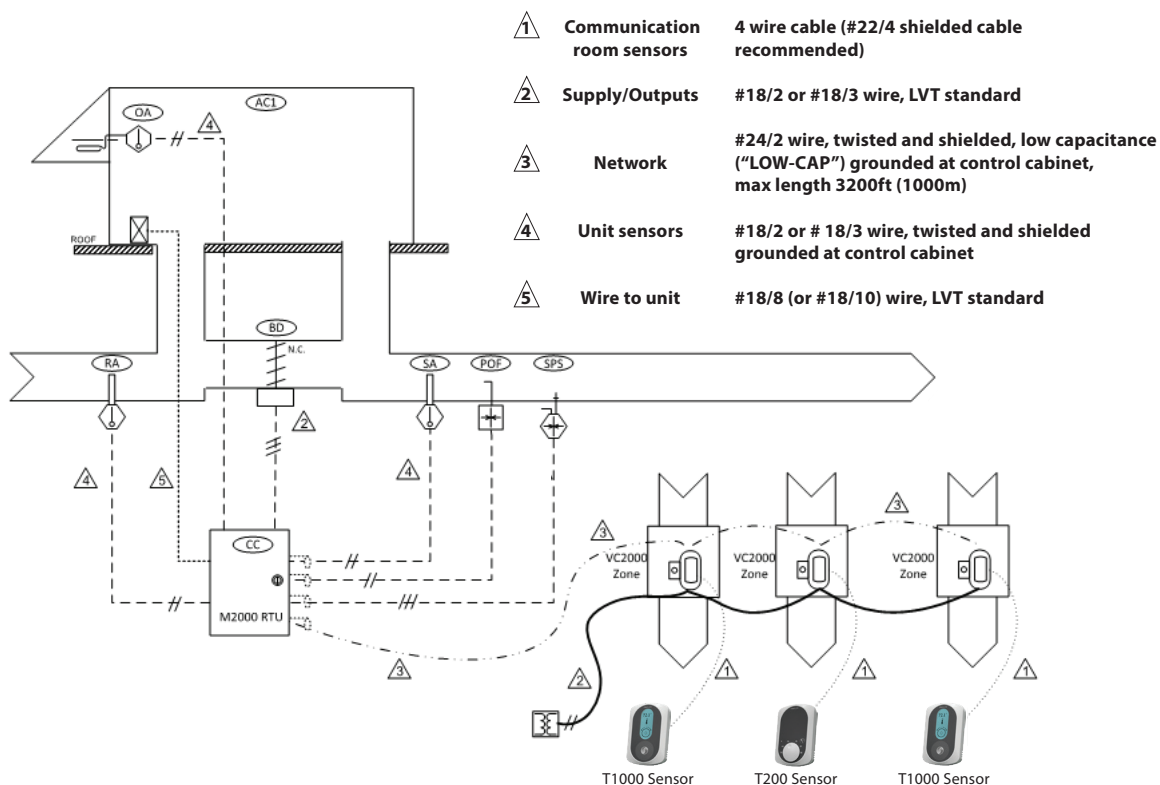


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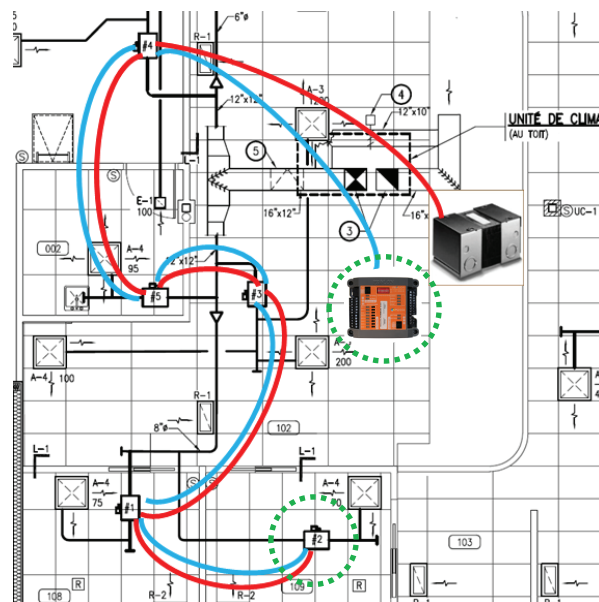
# Prolon Installation and Start Up Guide



System Layout and Cabling

## Part 1 - Project Preparation & Cabling

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 unit and zone controllers must be addressed. Their relative location on the network bus is 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. **The communication loop must be an open daisy chain and must not exceed 3200ft (1000m).**
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.



Wiring the Zones in a Network



## Part 2 - Installing the Components

### VAV Zone Controller

- Verify / validate the rotation direction of each zone damper.
- Close the damper and rotate the actuator clamp to the closed position using the clutch button.
- Install the zone controller on the damper and set in place with screws and bracket.
- While pressing the actuator's clutch button, turn the clamp manually, the damper should turn freely (slight off axis movement).
- Adjust mechanical stoppers to prevent overtravel. Full rotation of actuator should match that of 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

1. **Room sensor:** Install 60" from the floor. Avoid sunny or outdoor walls, diffusers and return grills. (Especially with bypass boxes.)  
**Beware of electrical boxes (light dimmers)!**  
(PL-T200 / PL-T500 / PL-T100)
2. **Outside air temperature sensor:** Install under air inlet hood or on the unit's north side **IN THE SHADE!**  
(PL-OAS)
3. **Supply air temperature sensor:** Install after the bypass damper junction. (PL-DS)  
**Return air temperature sensor:** Install before the bypass damper junction (no turbulence). (PL-DS)
4. **Static pressure sensor:** To be installed 2/3 of the main ventilation duct's length. (PL-MLP)
5. **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. (AFS)
6. **CO<sub>2</sub> Sensor:** Install in the return duct before the bypass junction. (CO<sub>2</sub>)
7. **Bypass damper actuator:** Mark the damper position on the shaft and validate its opening direction.





## Part 3 - Electrical Installation / Connections

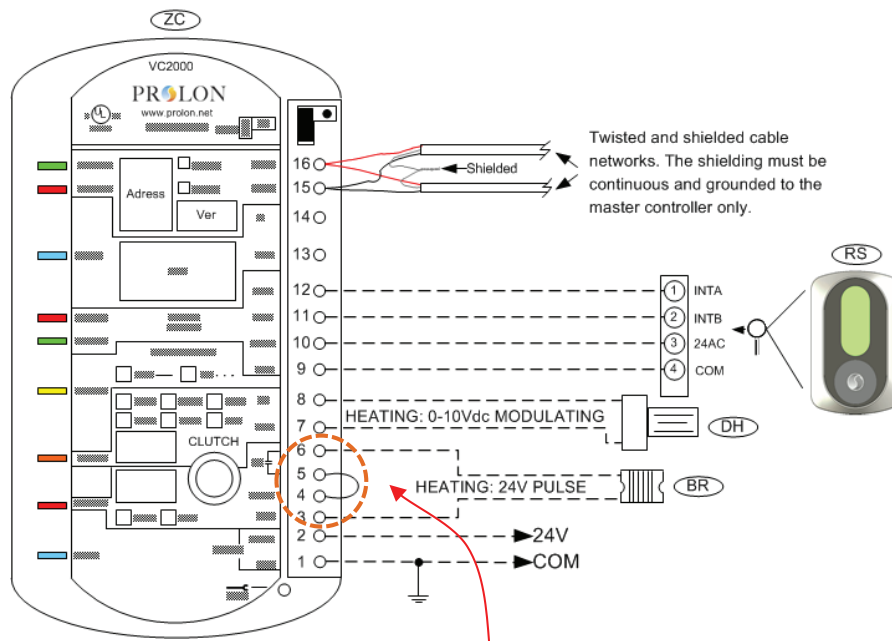
### VAV Zone Controller

#### Inputs

- **Wall Sensor** (PL-T200/T500/T1000): 4 wire cable (#22/4 shielded cable recommended) connected to terminals #9 to #12.
- **Changeover Sensor** (if required): directly to terminals #13 & #14.

#### Supply

- 5VA per zone / max 100VA per circuit.
- Link the #1 & #2 terminals in a daisy chain.
- Respect the live / common polarity on **all controllers**.
- **Ground the common (at central transformer).**
- Ground all controllers' commons. (if using multiple transformers).
- **Analog Output** (0-10VDC): connect to terminals #7(-) and #8(+). Respect the polarities.

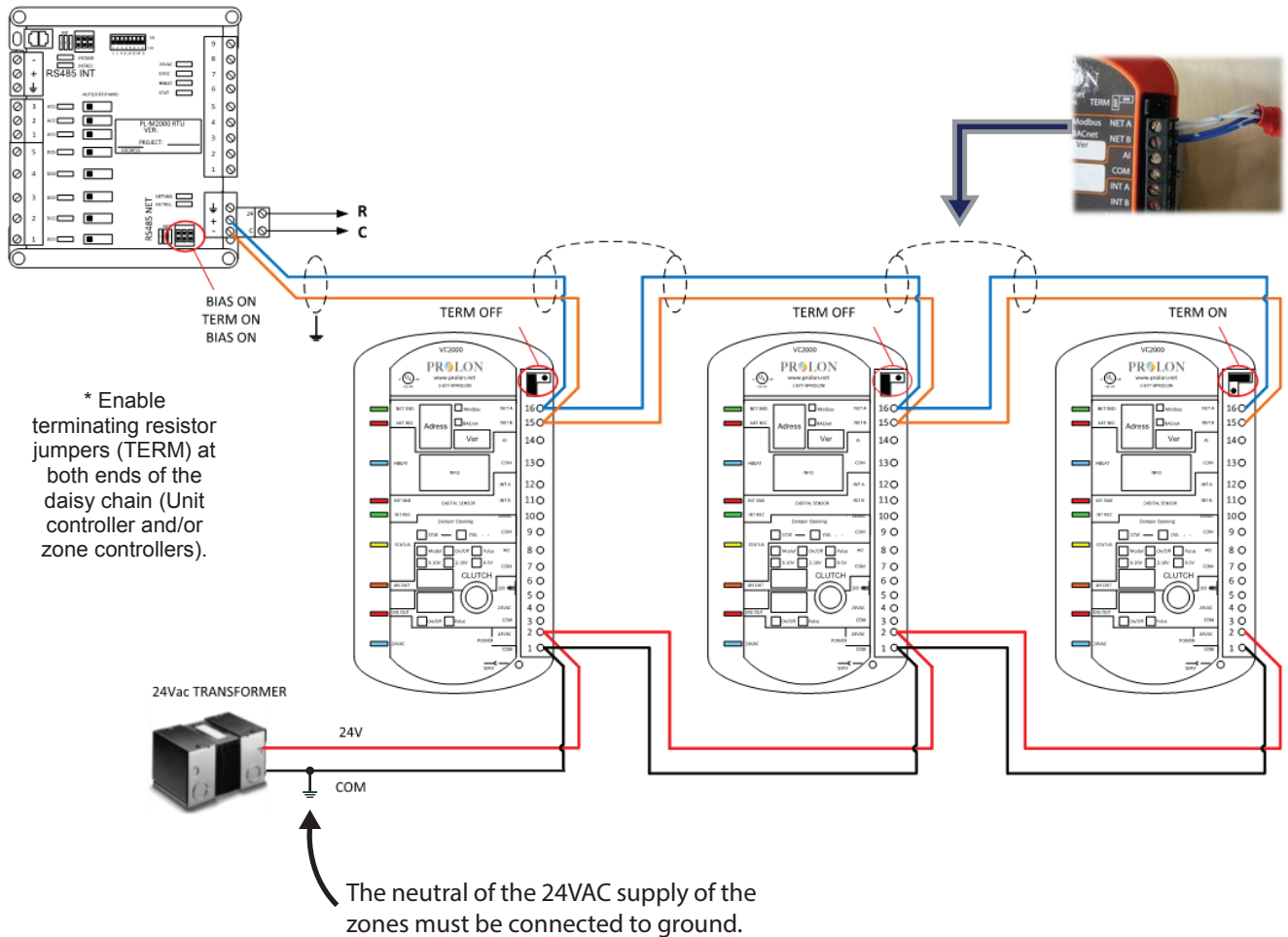


**Digital Output** (24VAC or dry contact): For dry contact, connect to terminals #5 and #6 (no jumper between #4 and #5). For 24VAC output, connect to terminals #3 and #6 (jumper installed between terminals #4 and #5).



## Network Cabling

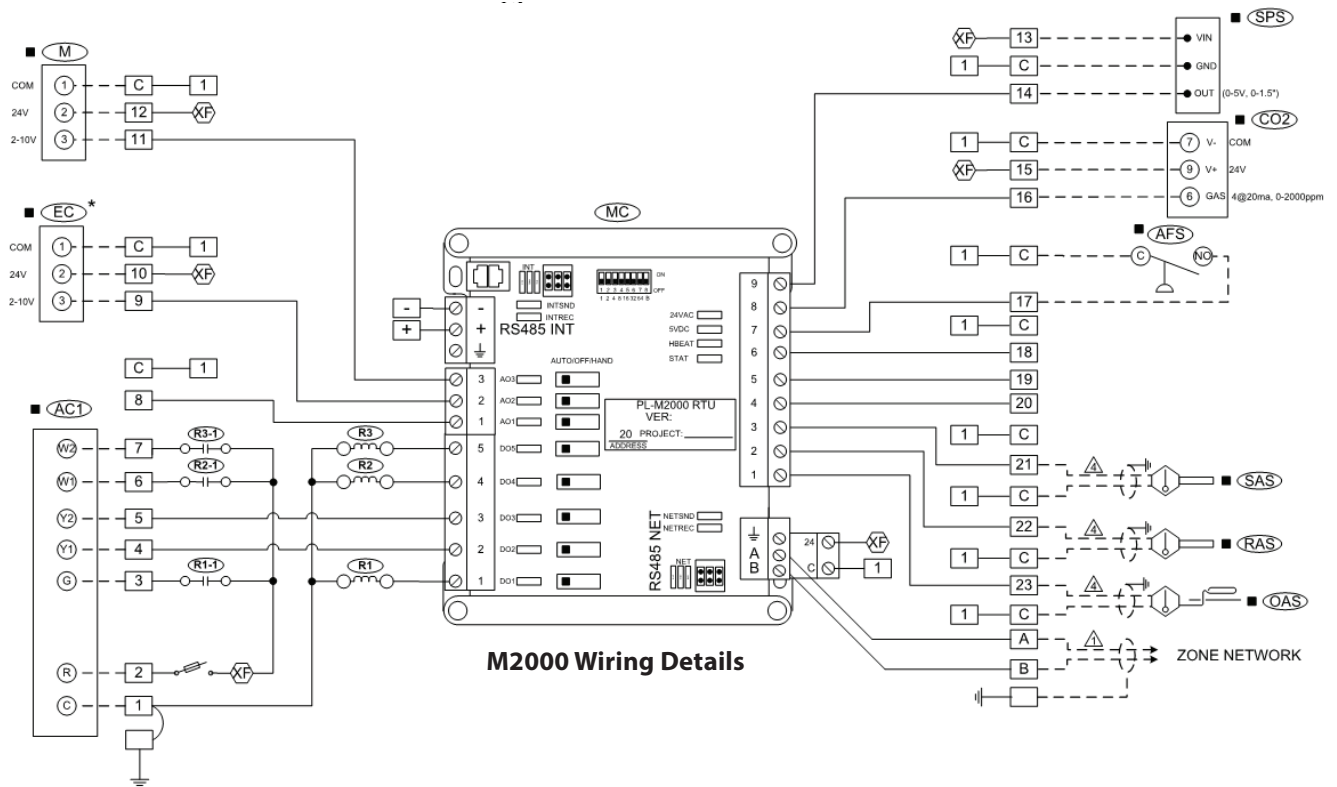
- Check for continuous daisy-chain to all zone controllers. **Do not link in a star pattern.**
- Check the A / B network polarity on all zones and unit controller; must all be identical.
- Join all shields at each controller's junction and connect one end only to the **ground lug in the central panel** only (unit controller).
- Check / activate terminating resistor jumpers ("TERM") on each of the controls located at both ends of the communication network.
- **The network cable must be shielded and twisted, 2 conductors AWG #24, low capacitance only, max length 3200ft (1000m).**
- **FASTEN YOUR WIRES TOGETHER AND SECURE THEM TO THE VAV BOX! (TIE-WRAPS, TAPE, ETC).**





## Unit Controller

- 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 only 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 "heartbeat" light.
- If zone controllers are supplied with digital display sensors, (PL-T500/T1000), make sure the sensor display lights up and shows ambient temperature.
- Make sure all zone dampers open in the proper direction (yellow "status" light). If not, invert rotation (procedure described in the V.2.0 troubleshooting guide).

### 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 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)

- Temporarily disconnect the supply air sensor from the unit controller (do not forget to reconnect!)

#### **Option 1 - Cooling**

- To verify cooling, each zone ambient temperature must be equal or above the zone's cooling low setpoint limit (default: 69°F / 20.5°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.
- Reconnect the supply air sensor to the unit controller.

#### **Option 2 - Heating**

- To verify heating, each zone ambient temperature must be equal or under the zone's heating high setpoint limit (77 °F / 25°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.
- Reconnect the supply air sensor to the unit controller.





## 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 7 or later software) as well as the most recent version of Prolon Focus. Visit the website [www.proloncontrols.com](http://www.proloncontrols.com) 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: "Rooftop" for a C1000 RTU or M2000 RTU air conditioning controller).
- 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 24VAC. 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.

### **Absolute override authorization**

- Double-click the unit controller and select the **"Config"** menu on the top left corner. Then select **"Edit display"** menu.



- 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 **"Zone 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 (pressure read + 20%) = 0.24", 0.05" = differential.
- Return to the **"Zone 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 **"Zone 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 **"Edit Display"** menu, and remove the absolute overrides and click **"Apply"**.

### **Inverting a zone damper's opening direction**

- To invert 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.

### **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 **"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.proloncontrols.com](http://www.proloncontrols.com) .

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