PROLON
controls

Thank you for purchasing the VAV - ProPack
This booklet will help you install your devices properly.

Included in this box:

· PL-VC2000-PI VAV Controller
· PL-T1000-WGL Wall Sensor
· PL-DT-T6 Duct Temperature Sensor
· Quick Installation Instruction
· Wiring diagram

Not included in the box:

· 24VAC Transformer
· #18/2 AWG stranded, shielded wire for 24V
· #22/2 AWG stranded, shielded for data
· PL-485-BT Connection Tool *(optional)*

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For Technical Support Contact
1-877-977-6566

Section 1 - Quick Installation Instructions   [PROPACK-VAV]

The PL-VC2000-PI standalone fonctions as a VAV controller & set up from the PL-T1000 wall module. However it is much easier to set up the PL-VC2000-PI from the smartphone app or Focus software using the PL-485-BT Prolon Connection tool.

1) Turn off 24VAC power before connecting any wires to the PL-VC2000-PI.

2) Manually close the VAV damper & verify if it opens clockwise or counterclockwise.

3) Press and hold the "Clutch" button on the PL-VC2000-PI & turn the actuator fully clockwise or counterclockwise depending on which way the damper actuates (PL-VC2000-PI factory settings are set to open counterclockwise). *(See section 5 to change the direction of the actuator directly on controller)*

4) Install the PL-VC2000-PI actuator on the damper shaft using the 2 nuts on the actuator clamp, slide the anti-rotation bracket up under the actuator so it engages the actuator at the center cutout, and secure the anti-rotation bracket to the VAV box with a self-tapping screw. *It is normal that the PL-VC2000-PI has some wiggle to it. As the actuator opens/ closes, the controller will travel slightly left/right on the anti-rotation bracket*.

5) Adjust the actuator's mechanical stoppers to match the full damper movement. *This will prevent the controller from overtravel once the damper is fully opened or closed.*

6) For pressure independent applications, connect the airflow measuring station to the high & low pressure tubes on the PL-VC2000-PI using 1/8" (inner diameter) PVC tubing. The high side faces the air coming from the RTU/AHU. For pressure dependent applications, disregard this step.

7) Install the PL-DT-T6 Duct Temperature Sensor on the inlet of the damper (air coming from the RTU/AHU). Connect the wires to the Analog Input on terminals 13 & 14.

8) Install the PL-T1000 wall module in the zone & connect it to the PL-VC2000-PI using 4 wires (2 for 24VAC power, and 2 for data). Respect the polarity (24V to 24V, COM to COM, + to +, - to -) *See section 2 for wiring details.*

9) If you are controlling an on/off device with either dry contact or 24VAC signals (duct heater, fan powered box, radiant floor, baseboard heat, or zone valve), connect device to Digital Output terminals. *See Section 2 for more details.*

10) If you are controlling a modulating device with 0-10Vdc or 2-10Vdc signal (duct heater, fan powered box, radiant floor, slave damper, occupancy, baseboard heat, or zone valve), connect device to Analog Output terminals. *See Section 2 for more details.*

11) Connect 24VAC power supply to the PL-VC2000-PI on terminal 1 (common) and terminal 2 (hot). Power supply transformer can power a single VAV controller, or can be daisy chained to power multiple VAV controllers. Provide 5VA per PL-VC2000-PI controller.

12) Upon applying power to the PL-VC2000-PI, the PL-T1000 wall sensor will power up simultaneously. Follow PL-T1000 screen instructions to address PL-VC2000-PI (address can be #1 through #127). *Note addresses 99 & 101 are reserved for other devices & it's good practice to avoid using those addesses. Do not use an address already showing on the system. Controllers with a duplicate address will not work. You can always change the address in the Focus software, app, or PL-T1000 wall module.*

13) To change settings on the VAV controller, all settings are accessible via the PL-T1000 Wall Sensor menus *(Note: see section 4)*

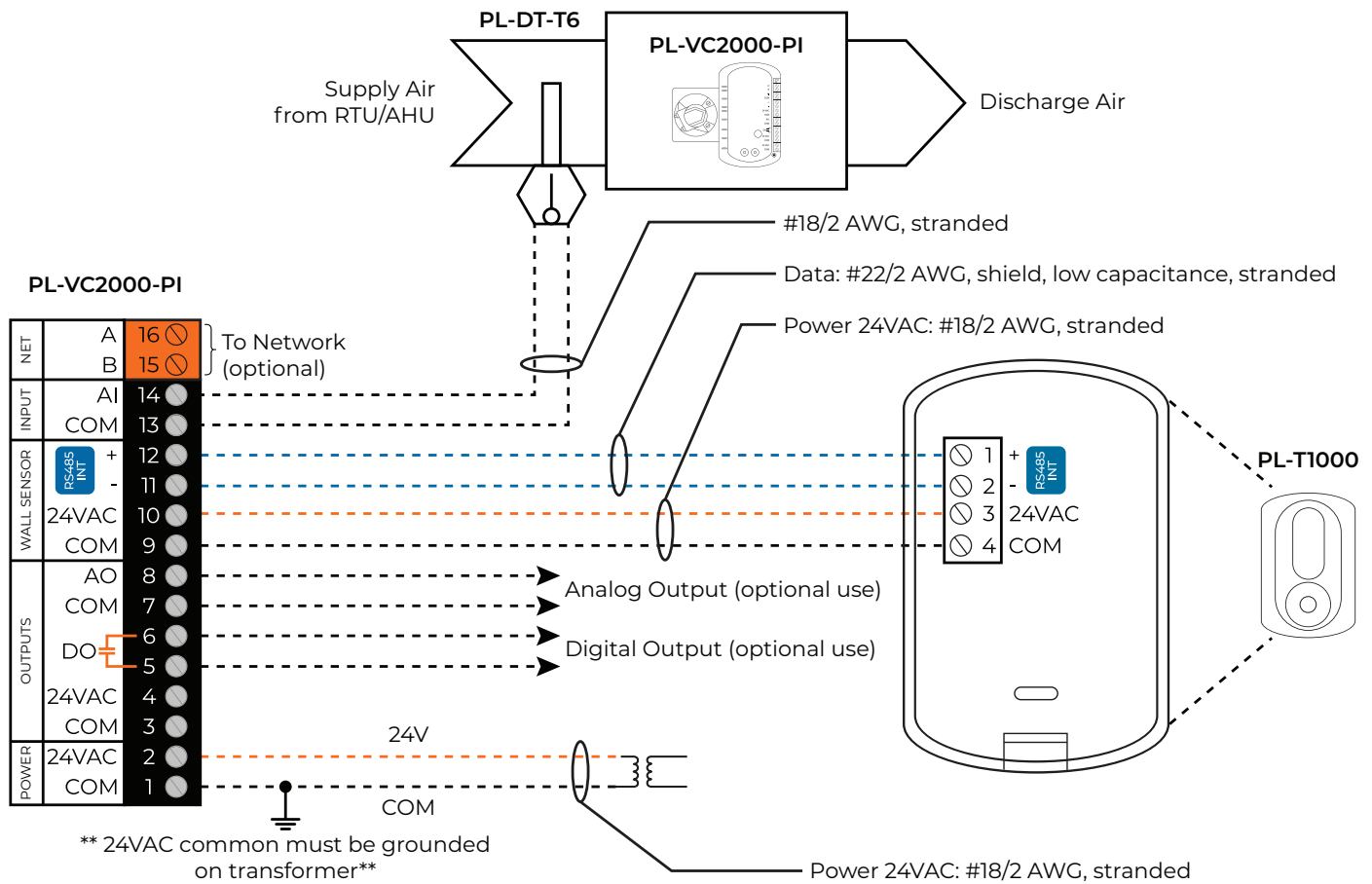*Full Instruction can be be downloaded from these QR Codes.*

View PL-VC2000 Installation Video

VAV Zone Controller - VC2000 Series Hardware Guide

Digital Sensor - T1000 Series Hardware Guide

PL-DT-T6

PL-VC2000-PI

Supply Air from RTU/AHU

Discharge Air

#18/2 AWG, stranded

Data: #22/2 AWG, shield, low capacitance, stranded

Power 24VAC: #18/2 AWG, stranded

PL-VC2000-PI

NET	A	16
	B	15
INPUT	AI	14
	COM	13
WALL SENSOR	RS485 INT +	12
	-	11
	24VAC	10
	COM	9
OUTPUTS	AO	8
	COM	7
	DO	6
		5
	24VAC	4
	COM	3
POWER	24VAC	2
	COM	1

To Network (optional)

1 + RS485 INT
2 -
3 24VAC
4 COM

PL-T1000

Analog Output (optional use)

Digital Output (optional use)

24V

COM

** 24VAC common must be grounded on transformer**

Power 24VAC: #18/2 AWG, stranded

Section 3 - Sequence of operation

Occupied Mode (default):
The space setpoints will be determined by the wall sensor.

If the space temperature rises above the cooling setpoint:
- if the duct temperature is colder than the room temperature, the damper opens proportionally to satisfy the demand, up to its Maximum Flow/Damper SP (adjustable).
- if the duct temperature is warmer than the room temperature, the damper will remain at its Minimum Flow/Damper SP (adjustable)

If the space temperature drops below the heating setpoint:
- if the duct temperature is warmer than the room temperature, the damper opens proportionally to satisfy the demand, up to its Maximum Flow/Damper SP (adjustable).
- if the duct temperature is colder than the room temperature, the damper will remain at its Minimum Flow/Damper SP (adjustable). When the space temperature returns to its deadband, the damper closes to maintain its Minimum Flow/Damper SP (adjustable).

Unoccupied Mode:
(Need Network Controller or Unit Controller-Master to give schedule)
The heating and cooling space setpoints will be lowered and raised, respectively.

If the space temperature drops below the Unoccupied Heating Setpoint or rises above the Unoccupied Cooling Setpoint, the damper will react in the same manner as Occupied. When the space temperature is satisfied, the damper will remain open.

Outputs can be configured to control the following

- Electric Duct Heater
- Hot Water Valve
- Fan Powered Box (parallel or series)
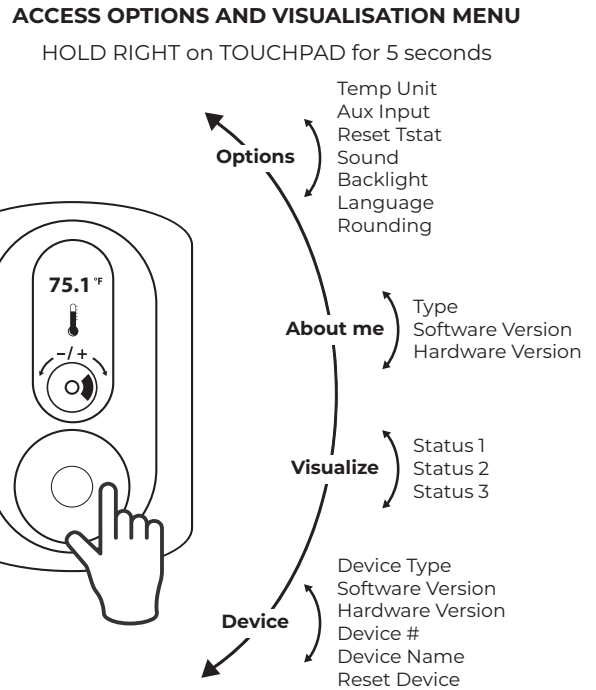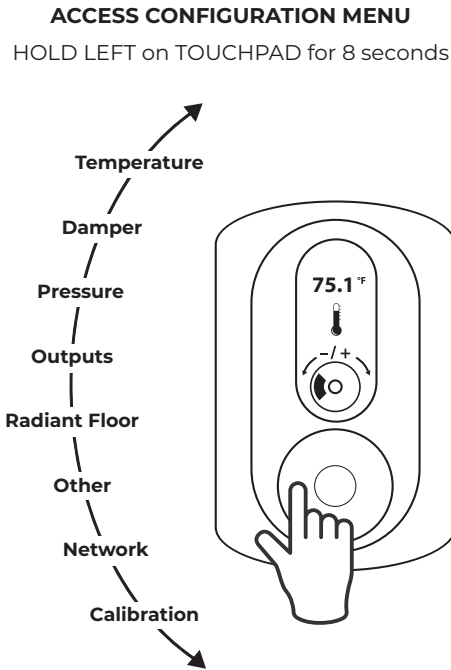- Electric Baseboard
- Radiant Floor Heat

Full Instruction can be downloaded from these QR Codes.

VAV Zone Controller Focus Guide

Digital Sensor - T1000 Series Hardware Guide

ACCESS CONFIGURATION MENU

HOLD LEFT on TOUCHPAD for 8 seconds

Temperature

Damper

Pressure

Outputs

Radiant Floor

Other

Network

Calibration

75.1 °F

ACCESS OPTIONS AND VISUALISATION MENU

HOLD RIGHT on TOUCHPAD for 5 seconds

75.1 °F

Options
- Temp Unit
- Aux Input
- Reset Tstat
- Sound
- Backlight
- Language
- Rounding

About me
- Type
- Software Version
- Hardware Version

Visualize
- Status 1
- Status 2
- Status 3

Device
- Device Type
- Software Version
- Hardware Version
- Device #
- Device Name
- Reset Device

Section 5 - Essential settings for proper operation

Access Configuration Menu
Change Damper Opening Rotation:
- Damper → Damper Setup → Opening Dir → CCW (default, change to "CW" for clockwise opening)

Change to Pressure Dependent/Independent Operation:
- Damper → Damper Movement → Source → Demand ("Demand" = Pressure Dependent, "Pressure" = Pressure Independent)

Set Minimum and Maximum Damper positions (Pressure Dependent only)
- Damper → Damper Movement → Min Vent Opening → 0% (default)
- Damper → Damper Movement → Max Damp Opening → 100% (default)

Set Minimum and Maximum Air Flow Setpoints (Pressure Independent only)
- Pressure → Flow SP → Min Vent SP → 90CFM (default)
- Pressure → Flow SP → Max Vent SP → 225CFM (default)

Air Balancing (Pressure Independent only)
Set Duct Diameter:
- Pressure → Duct Setup → Diameter → 8" (default)

Set K-Factor:
- Pressure → Duct Setup → K Factor → 2.39 (default)

Scroll clockwise or counterclockwise to adjust or navigate

– / +

Tap here to go **BACK**

Tap here to **ENTER**
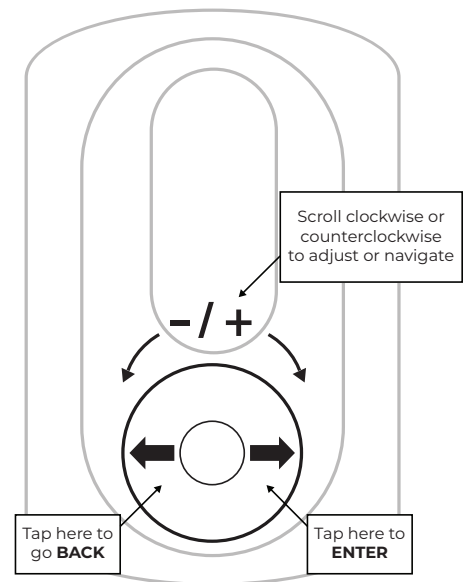
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Digital Sensor - T1000 Series Hardware Guide

For more information on the T1000 configuration menus, see the following YouTube video

RS485 NET SND (RED) AND REC (GREEN)
If **PL-VC2000-PI is standalone**, disregard these LED's.
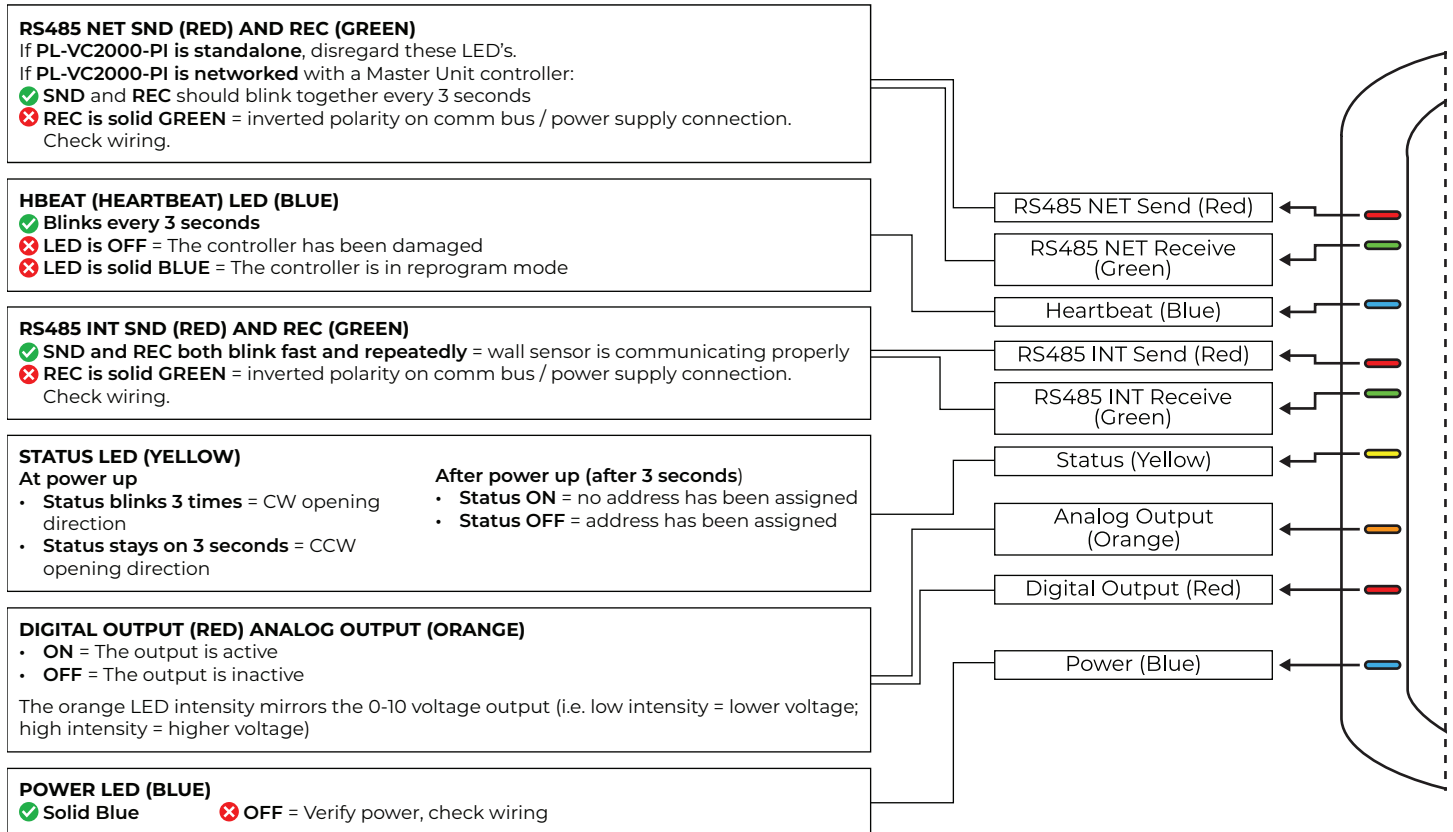If **PL-VC2000-PI is networked** with a Master Unit controller:
✅ **SND** and **REC** should blink together every 3 seconds
❌ **REC is solid GREEN** = inverted polarity on comm bus / power supply connection. Check wiring.

HBEAT (HEARTBEAT) LED (BLUE)
✅ **Blinks every 3 seconds**
❌ **LED is OFF** = The controller has been damaged
❌ **LED is solid BLUE** = The controller is in reprogram mode

RS485 INT SND (RED) AND REC (GREEN)
✅ **SND and REC both blink fast and repeatedly** = wall sensor is communicating properly
❌ **REC is solid GREEN** = inverted polarity on comm bus / power supply connection. Check wiring.

STATUS LED (YELLOW)
At power up
- **Status blinks 3 times** = CW opening direction
- **Status stays on 3 seconds** = CCW opening direction

After power up (after 3 seconds)
- **Status ON** = no address has been assigned
- **Status OFF** = address has been assigned

DIGITAL OUTPUT (RED) ANALOG OUTPUT (ORANGE)
- **ON** = The output is active
- **OFF** = The output is inactive

The orange LED intensity mirrors the 0-10 voltage output (i.e. low intensity = lower voltage; high intensity = higher voltage)

POWER LED (BLUE)
✅ **Solid Blue**   ❌ **OFF** = Verify power, check wiring

| RS485 NET Send (Red) |
| RS485 NET Receive (Green) |
| Heartbeat (Blue) |
| RS485 INT Send (Red) |
| RS485 INT Receive (Green) |
| Status (Yellow) |
| Analog Output (Orange) |
| Digital Output (Red) |
| Power (Blue) |

Section 7 - FAQ (Frequently Asked Questions)

1) **What power is needed?**
Prolon controllers need 24VAC to run. If powering multiple controllers from a single transformer, provide 5VA per PL-VC2000-PI controller.

2) **What wiring is needed to for this controller?**
- 24VAC Supply: #18/2 AWG on terminals 1 (COM) and 2 (HOT)
- Wall Sensor: #18/2 AWG on terminals 9 & 10 for 24VAC supply and #22/2 AWG low capacitance twisted & shielded, on terminals 11 & 12 for data. A single #22/4 twisted & shielded for both Power and Data is also acceptable.

3) **Can this controller be connected to the internet?**
Yes, this controller may be connected to the internet. To do so, a PL-NC2000 Network Controller is required (not included in ProPack)

4) **Can this controller be connected/networked to other Prolon devices?**
Yes it can. To connect a controller to another controller you will need #22/2 AWG (stranded, shielded, low capacitance), and will connect to terminals 15 and 16 (NET A; NET B) in a daisy chain pattern.

5) **Can this controller connect wirelessly to the wall sensor?**
Yes it can. Simply add QTY 1 PL-TREE-COM wireless adapter to the controller and QTY 1 PL-TREE-COM to the wall sensor. (NOTE: both controller and wall sensor need Power Supply 24VAC even if wireless) **(PL-TREE-COM is not included in ProPack)**

6) **Is a CO2 transmitter required?**
No, it is not required. A PL-DT-CO2 (not included in ProPack) may be added.

7) **Does every controller need an address?**
Yes, a unique address is required for each controller and its T1000 wall sensor to communicate together.

8) **Can I change the controller address?**
Yes, the address can be changed via the PL-T1000 menus. Options & Visualisation Menu → Device → Device #

9) **The damper is always open and never closes even if I change the setpoints. What is wrong?**
It is likely the controller is reading air flow (CFM), and the airflow reading is lower than the setpoint, and so the damper remains open to reach its targeted airflow setpoint.

10) **Can I see the airflow readings on the PL-T1000 sensor?**
Yes. Options & Visualisation Menu → Visualize → Status 1-2-3

11) **When I power up the controller, the actuator does a full open/close cycle. Is that normal?**
Yes. The actuator will open/close completely to validate its full open/full closed positions.

12) **If I press the Clutch button and move the damper manually while the controller is powered, will it damage the controller? Must I do something after?**
The controller will not be damaged if the clutch button is pressed and the damper moved manually, however the controller will lose its last known damper position. Once the manual damper movements have been completed, simply reset the 24VAC power supply to get the controller back to its normal working state.