MiniLink PD 5
Technical Guide

WARNING!
POLARITY MUST
BE OBSERVED OR THE
BOARD WILL BE DAMAGED

24 VAC POWER ONLY

LOCAL LOOP COMM CONNECTORS
NETWORK LOOP COMM CONNECTORS
ADDRESS DIP SWITCH
POWER TERMINALS
Overview

The OE364-23-OR MiniLink PD 5 is a communications device that is used to integrate multiple local communication loops into a network communications system. See Figure 1, page 3 for dimensions.

The MiniLink PD 5 is required on the Orion Control system to separate local loops. Up to 60 MiniLink loops can be on a system.

Local loop terminals of the MiniLink PD 5 are designed to connect to controllers that are daisy-chained together on its local communications loop.

Network loop terminals on the MiniLink PD 5 are used to daisy-chain multiple MiniLinks back to a CommLink 5 to form a network communications loop. This provides for a fully networked communications system.

The MiniLink PD 5 is required for VAV systems to allow information to be shared between the VAV unit controller and the Orion VAV boxes. It is also required for zoning systems to facilitate voting of the zones to determine the HVAC units heating and cooling mode of operation. It also provides tenant-logging capabilities.

Features

The MiniLink PD 5 utilizes token passing communication architecture. The MiniLink PD 5 is designed to serve as the local communications loop master. This means that it is responsible for sending the token to all the controllers on the local communications loop.

Network communications are RS-485 type operating at 19,200 or 115,200 baud. Local communications are also RS-485 type and operate at 9600 or 57,600 baud.

The MiniLink PD 5 is factory default set to low speed. The baud rate is set with dipswitches 7 & 8. See Figure 4, page 7.
Environmental Requirements

The MiniLink PD5 needs to be installed in an environment that can maintain a temperature range between 14°F and 122°F and a humidity range between 5% and 95% RH (non-condensing).

Mounting

The MiniLink PD 5 is housed in a plastic enclosure. It is designed to be mounted by using the 3 mounting holes in the enclosure base. It is important to mount the device in a location that is free from extreme high or low temperatures, moisture, dust, and dirt. Be careful not to damage the electronic components when mounting the MiniLink PD 5. The printed circuit board plastic cover has a UL94V0 flame rating.

Figure 1: MiniLink PD 5 Dimensions
**CAUTION:**
Disconnect All Communication Loop Wiring From The MiniLink Before Removing Power From The Controller. Reconnect Power And Then Reconnect Communication Loop Wiring.

**NOTE:** All Communication Wiring Must Be Plenum-rated. Minimum 18-gauge, 2-conductor, Twisted Pair With Shield Wire. WattMaster can supply Communication Wire that meets this specification and is color coded for the network or local loop. The local loop wire part number is WR-LL-WG-18, is color coded with green candy striping and comes on a 1000 Ft spool. The network loop wire part number is WR-NL-WR-18, is color coded with red candy striping and comes on a 500 Ft spool. If desired, 18 gauge minimum Belden #82760 or equivalent communications wire may also be used for network or local loop wiring.

**Connect Local Loop**
Terminals To T, SH & R
Local Loop Terminals On First Controller On Local Loop. Be Sure To Wire T To T, SH To SH & R To R.

**NOTE:**
This network wiring is not required on single loop systems without a CommLink. When a CommLink is used on single loop systems, connect network loop wire terminals to the CommLink.

**CAUTION:**
Disconnect All Communication Loop Wiring From The MiniLink Before Removing Power From The Controller. Reconnect Power And Then Reconnect Communication Loop Wiring.

**WARNING!**
Polarity Must Be Observed Or The Board Will Be Damaged
Loop Net On For Hi SPD

**Some Installers Like To Use One Large 24 VAC Transformer**
To Power Several Devices. This Is Allowable As Long As Polarity Is Maintained To Each Device On The Transformer Circuit.

**WARNING:**
If Polarity Is Not Maintained, Severe Damage To The Devices May Result. WattMaster Recommends Using A Separate Transformer For Each Device In Order To Eliminate The Potential For Damaging Devices Due To Incorrect Polarity.

Using Separate Transformers Also Allows Redundancy In Case Of A Transformer Failure. Instead Of Having 8 Devices Inoperative Because Of A Malfunctioning Transformer, You Have Only 1 Device Off Line.

**Connect Local Loop Comm Cable To Power Comm Board (If Used).**

**NOTE:**
This network wiring is not required on single loop systems without a CommLink. When a CommLink is used on single loop systems, connect network loop wire terminals to the CommLink.

**On Multiple Loop Systems, Connect Modular Cable To Next MiniLink’s Network Comm Connector Or Connect Network Loop Wire Terminals To CommLink And Daisy Chain All MiniLink Network Terminals Together. Be Sure To Wire T To T, SH To SH & R To R.**

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*Figure 2: MiniLink PD 5 Wiring*
Address Dipswitch Setting

NOTE: The Power To The MiniLink Must Be Removed And Reconnected After Changing The Address Switch Settings In Order For Any Changes To Take Effect.

Address Switch Shown Is Set For Address 1

Address Switch Shown Is Set For Address 13

The Address For Each MLPD5 Must Be Unique To The Other MLPD5s On The Network Loop And Be Between 1 and 60.

Figure 3: Address Dipswitch Setting
Network Loop & Local Loop Baud Rate Settings

NOTE: The MiniLink PD 5 is Factory Set to Low Speed.

NOTE: The Power To The MiniLink Must Be Removed And Reconnected In Order For A Baud Rate Change To Take Effect.

<table>
<thead>
<tr>
<th>BAUD</th>
<th>NETWORK LOOP SWITCH 7</th>
<th>SPEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>115,200</td>
<td>ON</td>
<td>HIGH*</td>
</tr>
<tr>
<td>19,200</td>
<td>OFF</td>
<td>LOW**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BAUD</th>
<th>LOCAL LOOP SWITCH 8</th>
<th>SPEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>57,600</td>
<td>ON</td>
<td>HIGH***</td>
</tr>
<tr>
<td>9600</td>
<td>OFF</td>
<td>LOW****</td>
</tr>
</tbody>
</table>

* The Network Loop (Switch 7) must be set to High Speed if it is connected to a loop that includes a CommLink 5 set to High Speed.

** The Network Loop (Switch 7) must be set to Low Speed if it is being used on a system that includes a CommLink 5 set to Low Speed.

*** The Local Loop (Switch 8) must be set to High Speed if it is connected to a loop that ONLY includes VCB-X Controllers set to high speed and/or VCC-X Controllers.

**** The Local Loop (Switch 8) must be set to Low Speed if it is being used on a system that includes the VCM-X Controller or older generation of Orion Controllers.

Figure 4: Baud Rate Dipswitch Setting
Networked Single Loop Wiring

Figure 5: MiniLink PD Networked Single Loop Wiring
**MiniLink PD 5**

**Power Comm Board Wiring**

**NOTE:** The MiniLink PD 5 will connect to a Power Comm Board Only If Power Comm Cables are Used to Daisy-Chain Between VAV-Zone Controllers.

**WARNING!** DO NOT GROUND THE 24V TRANSFORMER THAT IS TO BE USED WITH THE POWER/COMM BOARDS. GROUNDING OF THE TRANSFORMER WILL DAMAGE THE POWER/COMM BOARD AND ALL BOARDS CONNECTED TO IT. A SEPARATE TRANSFORMER MUST BE USED FOR EACH POWER/COMM BOARD. NO EXCEPTIONS. DO NOT CONNECT ANY OTHER DEVICES TO THE TRANSFORMER USED FOR THE POWER/COMM BOARD!

![Diagram showing Power Comm Board Wiring for Modular Systems](image)

**NOTE:** Diagram Shown Is For Wiring Of Power/Comm Board When Used For Connecting Local Loop Devices Such As VAV/Zone Controllers, System Manager(s) and Other Power/Comm Boards.

A Power/Comm Cable Can Be Used To Connect With The MiniLink PD 5's Local Loop Connection Instead Of Using 2 Conductor Twisted Pair With Shield Cable. You Can Also Use A Power/Comm Cable To Connect With Another Power/Comm Board, A System Manager Or A VAV/Zone Controller.

If Desired, Instead Of Using A Power/Comm Cable, You Can Use 2 Conductor Twisted Pair With Shield Cable To Connect To The Power/Comm Board From The Unit Controller, MiniLink PD 5's Local Loop Connection, Or Another Power/Comm Board.

All Comm Loop Wiring Is Straight Through

Power/Comm Cable To Other Power/Comm Board(s), System Manager, Or VAV/Zone Controllers On Local Loop Only.

**Figure 7:** Power Comm Board Wiring for Modular Systems
Figure 8: Networked Multi-Loop Wiring for Modular Systems