



PDS-204GCO™

PDS-204GCO™ —Getting Started User Guide

Introduction

PDS-204GCO™ is a next-generation outdoor Power over Ethernet (PoE) switch for smart cities. It allows Wi-Fi® access points, security network cameras, and many other IoT devices to receive power and data over standard Ethernet cables, leaving network infrastructure completely unaltered.

This user guide describes the initial configuration of the PDS-204GCO network switch.

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1. Initial Configuration

You can configure the PDS-204GCO unit for the first time using a web interface or Telnet/SSH. Microchip recommends you to use the web interface to configure easily.

For information regarding Telnet/SSH configuration, see the *CLI Commands User Manual*.

1.1 Configuring the Unit Default IP Address, Username, and Password

The PDS-204GCO outdoor PoE switch is shipped with the following specifications:

- Default IP address: 192.168.0.50
- Username: admin
- Password: A unique random password varies from unit to unit and can be found on the label attached to the left side of the device

When you restore the unit to factory default by using an external loopback and no PoE PDs upon power up, the unit IP address (192.168.0.50), username (admin), and same unique password (not to be confused with restoring the unit to factory default from the web, which keeps the unit with the same IP address) is restored.

Note: It is the user's responsibility to keep a record of the unit's unique default password. The unit's unique password cannot be retrieved beyond the label on the left side of the device.

1.2 Setting Unit IP Address

The following figure and steps show how to set the unit IP address for the first time.

Figure 1-1. Unit IP Address Window

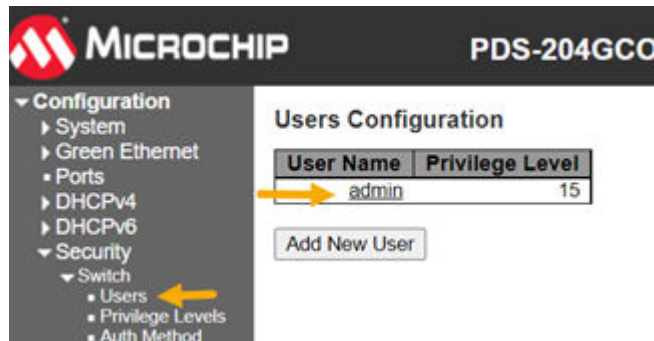
The screenshot shows the web interface for the PDS-204GCO™ Outdoor PoE-BT Switch. The left sidebar contains a 'Configuration' menu with options like System, IP, SNMP, NTP, Time, Log, Monitor, Green Ethernet, Ports, DHCPv4, DHCPv6, Security, Aggregation, Loop Protection, Spanning Tree, LLDP, PoE, MAC Table, VLANs, QoS, Mirroring, UPnP, sFlow, Monitor, Diagnostics, and Maintenance. The main content area is titled 'IP Configuration' and includes fields for Domain Name, DNS Servers, and DNS Proxy. Below this is the 'IP Interfaces' section with a table for DHCPv4 configuration. The table has columns for Delete, IF, Enable, Type, Client ID (Opt #61), Hostname (Opt #12), Failback, Current Lease, Address, and Mask Length. The first row shows VLAN 1 with an IP address of 192.168.0.50 and a mask length of 24. Below the table is a note about DHCP address changes and a section for IP Routes (Default-Gateway). At the bottom, there are 'Add Interface', 'Add Route', 'Save', and 'Reset' buttons. Arrows in the image point to the 'IP' menu item, the 'IP Configuration' section, the 'IP Interfaces' table, and the 'Save' button.

1. Browse to unit IP address 192.168.0.50 using the username and password, as described in the preceding section.
2. Browse to the web page **Configuration > System > IP** to modify the unit IP address.
3. Click **Save** to change the unit running IP address to the new address.
4. Press the upright storage icon to save running-config into startup-config.

1.3 Changing Username and Password

The following figure and steps show how to change username and password for the first time.

Figure 1-2. Changing Username and Password



1. Browse to unit IP address 192.168.0.50 using the username and password, as described in the preceding section.
2. Browse to web page **Configuration > Security > Switch > Users** to modify remote access username and password.

Note: It is recommended to add a second user with a lower privilege level (15 = administrator level) to restrict second user from getting access to all unit configuration options.

1.4 Saving Configuration Changes

When you click **Save** on various configuration web pages, the modified parameter is immediately changed as part of running-config. However, it is not permanently saved until an explicit configuration save action is done.

The following are the three different ways to save running-config into startup-config:

- From the web browser, click the storage icon at top right: 
- From the web browser, open the web page **Maintenance > Configuration > Save startup-config**.
- From Telnet/SSH-type the command, copy running-config startup-config.

Figure 1-3. Save running-config to startup-config From Telnet/SSH CLI Interface

```
username: admin
Password:
# copy running-config startup-config
Building configuration...
% Saving 887 bytes to flash:startup-config
#
```

2. Restoring PDS-204GCO Unit to Factory Default

This section describes the following two scenarios:

- Restoring the unit to factory default without knowing the unit IP, username, or password.
- Restoring the unit to factory default from within the unit web browser, after the user successfully logging in to the unit.

2.1 Unknown Unit-IP, Username, or Unit Password

Perform the following steps to reset the unit to factory default, restore the unit IP to 192.168.0.50, username to admin, and password as per the label on the unit.

1. Turn OFF the unit power.
2. Disconnect all PoE devices from the unit.
3. Disconnect all ethernet connections from the unit.
4. Connect a single Ethernet cable to unit port #1 and the other cable end to port #2 (any two ports).
5. Turn the unit power ON and wait for 90s before turning the unit power OFF again, followed by disconnecting the Ethernet cable from ports #1 and #2.
6. Turn ON the unit, and connect the Ethernet cable from your computer to one of the unit ports.

After approximately 40s from powering up, you can access the unit over IP 192.168.0.50, user as admin, and password as marked on the unit label.

2.2 Factory Default From Web Interface (Excluding Unit IP)

This option must be used when you have to restore the unit to semi-factory default, leaving only the unit network access configuration unchanged.

By keeping the unit IP address unchanged, the remote user has the option to access the unit from the remote, although most other unit parameters are restored to factory default.

- Use the web interface to access the web page **Maintenance > Factory Default** and initiate the factory default process.
- Wait several seconds to let the Factory Default process finish followed by **Configuration Factory Reset Done**.
- Save new running default configuration by accessing the web page **Maintenance > Configuration > Save Startup-Config**.

Note: Only running-config is restored to factory default. To make the factory default parameter changes permanent, you must save running-config to startup-config.

3. Web Interface

This section provides a general description of the web interface and the home web page.

The web interface is constructed from three main panels. The top and left panels are stationary while the middle panel changes per user action. See the following figure.

Figure 3-1. Unit Main Web Interface

Port State Overview

Hostname: _____ Auto-refresh ☒ Refresh

Ports - Network Status

#	Type	Status	Speed	Local Link		Remote Network Device-LLDP/CDP		
				Aggr Ports	Transmit	Receive	System Name	System Description
1	Copper	---	---	---	---	---	---	---
2	Copper	---	---	---	---	---	---	---
3	Copper	---	---	---	---	---	---	---
4	Copper	Up	1Gfdx	---	0.6 Kb/s	0 Kb/s	---	---
5	Sfp	---	---	---	---	---	---	---
6	Sfp	Up	1Gfdx	---	15.4 Kb/s	4 Kb/s	---	---

Ports - PoE Status

#	PoE-BT Port Type	Power management Mode	Status	Local PoE Port Status				Remote PoE Device		
				Requested Power	Assigned Power	Delivered Power	Assigned Class	PD Measured Class	PD Auto Class Support	PD Requested Power over LLDP
1	Type4 90[W]	Dynamic	On	30 [W]	30 [W]	1 [W]	3.3	0.0	---	---
2	Type4 90[W]	Dynamic	On	60 [W]	60 [W]	2.6 [W]	4.4	4.4	---	---
3	Type4 90[W]	Dynamic	On	90 [W]	90 [W]	0.5 [W]	5.5	5.5	---	---
4	Type4 90[W]	Dynamic	On	60 [W]	60 [W]	4 [W]	6	6	No	---

System - Status

Item	Value
Total Power Usage	8 [W]
Total Allocated Power	7 [W]
Free Available Power	144 [W]
Power Supply Voltage	53.5 [V]

- Left panel—Used to configure, monitor, diagnose, and perform unit maintenance.
- Top panel—Offers easy access to save the latest unit configuration, return to the main home page, log out, and provide help information for the middle panel web page.
- Middle panel—Varies, based on the option selected from the left panel.

Note: Only single help web page can be opened at a given time. You must close an existing web page to be able to open a new one.

3.1 Home Web Page

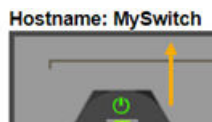
The home web page gets updated dynamically (if the **Auto-Refresh** check box is checked) and reports the unit's overall status. This saves from switching between various status web pages.

Note: The log file is used to track various unit events, such as Ethernet link, PoE status change, and so on.

3.1.1 Hostname

User Hostname is reported on the top left, enabling easy differentiation between multiple similar units. The hostname can be easily configured through web interface **Configuration > System > Information** from CLI command `hostname`.

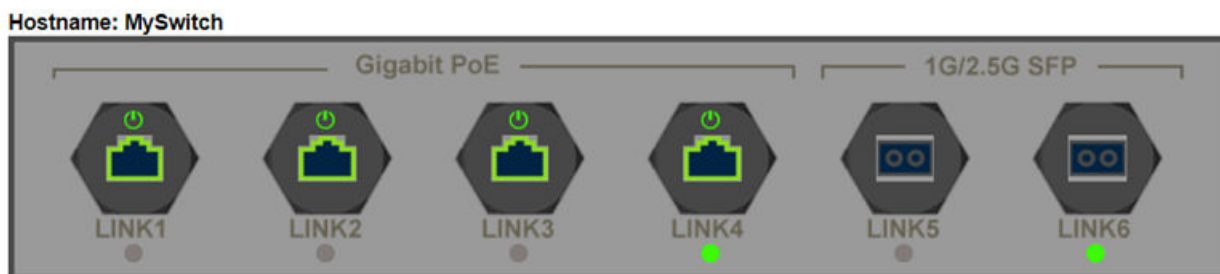
Figure 3-2. Unit Hostname



3.1.2 Ethernet, SFP, and PoE Port State

The following figure shows the unit front panel.

Figure 3-3. Unit Front Panel



Ethernet Link LED image reports every time the Ethernet port is enabled and the link is up. Enabled only or Disabled. Hovering over the Link LED with the mouse reports the link state. Pressing on the Link LED reports more detail about the port Network traffic. PoE LED images report if power is being applied to the PD device. Ethernet RJ45 images report if PoE is enabled or disabled, and various possible PoE errors.

Table 3-1. Ethernet Link LED Images

Ethernet Link LED Images	Description
	The Ethernet link is ON
	The Ethernet link is OFF
	The Ethernet link is disabled
	PoE is enabled (regardless of power)
	PoE is disabled
	PoE power applied to PoE-PD device
	No PoE power applied to the PoE-PD device
	The SFP Ethernet port is enabled
	The SFP Ethernet port is disabled

The following table lists the several possible PoE fault reports that might be present in the PoE ports.

Table 3-2. PoE Fault States

PoE Fault States LED Images	Description
	Fail to communicate with the PoE controller.
	Fail to power PD. Insufficient free power [W].
	PoE fault—Fail to power PD.
	PoE overload—PD power consumption exceeded the maximum limit.

The following table lists the additional information which can be accessed by hovering the mouse over LED, RJ45, and SFP images.

Table 3-3. LED, RJ45, and SFP Images

LED, RJ45, and SFP Images	Description
	PoE port status followed by PoE-Controller internal state index and its description. For example, PoE: On (ID = 0×89: 4P Pwr on 4P DSPD).
	Ethernet link status and speed
	PoE status and PD power consumption
	SFP Ethernet link state

The following table lists the images/icons which redirect the you to the following web pages.

Web Pages Icons	Description
	Monitor—PoE Status web page
	Monitor—Detailed Port Statistics
	Monitor—PoE Status
	Monitor—Detailed Port Statistics

3.1.3 Ports—Network Status

Ports—Network Status provides important network information from the switch and end device.

Table 3-4. Ports—Network Status

#	Local Link						Remote Network Device—LLDP/CDP		
	Type	Status	Speed	Aggregate Ports	Transmit	Receive	System Name	System Description	IP Address
1	Copper	—	—	—	—	—	—	—	—
2	Copper	—	—	—	—	—	—	—	—
3	Copper	—	—	—	—	—	—	—	—
4	Copper	Up	1 Gfdx	—	0 Kb/s	0 Kb/s	—	—	—
5	SFP	—	—	—	—	—	—	—	—
6	SFP	Up	1 Gfdx	—	8.4 Kb/s	02.6 Kb/s	—	—	—

- **#:** Unit logical port numbers 1–6. However, while using the CLI interface, the ports are named as following:
 - interface GigabitEthernet 1/1—interface GigabitEthernet 1/4
 - interface 2.5 GigabitEthernet 1/1—interface 2.5 GigabitEthernet 1/2
- **Type:** Copper/SFP. Ports 1–4 are Gigabit copper ports. Ports 5–6 are SFP 2.5 Gigabit SFP ports with a default of 1 Gigabit link speed. You must configure SFP port to 2.5 Gigabit when a dedicated 2.5G Gigabit SFP is in use.
- **Status:** Link port status:
 - —: Port is enabled. The link is down.
 - Up: Port is enabled. The link is up.
 - Disabled: Port is disabled.
- **Speed:** Port link speed—10 Mbps, 100 Mbps, 1 Gbps, and 2.5 Gbps.

Note: SFP ports use by default 1 Gigabit connection speed. For other SFP link speeds such as 2.5 Gbit or 100 Mbit, manual configuration is required.
- **Aggregation Ports:** Report aggregated port numbers when port aggregation is in use. For example, P3 and P4 means that ports #3 and #4 are used as one logical aggregated port, doubling logical aggregated speed to 2 Gigabit.
- **Transmit:** Average transmits data rate in kbps/Mbps.
- **Receive :** Average receive data rate in kbps/Mbps.
- **System Name:** Remote Network device system name as advertised over LLDP/CDP (when enabled).
- **System Description:** Remote Network device system description as advertised over LLDP/CDP (when enabled).
- **IP Address:** Remote Network device IP address as advertised over LLDP/CDP (when enabled).

3.1.4 Ports—PoE Status

Ports—PoE Status reports major configurations and status PoE parameters. The following table lists the Switch PoE parameters (left columns) and the remote PD PoE parameters (right columns).

Table 3-5. Ports—PoE Status

#	Local PoE Port Status							Remote PoE Device		
	PoE-BT Port Type	Power Management Mode	Status	Requested Power	Assigned Power	Delivered Power	Assigned Class	PD Measured Class	PD Auto Class Support	PD Requested Power Over LLDP
1	Type4 90 [W]	Dynamic	On	30 [W]	30 [W]	1 [W]	3.3	0.0	—	—
2	Type4 90 [W]	Dynamic	On	60 [W]	30 [W]	2.6 [W]	4.4	4.4	—	—
3	Type4 90 [W]	Dynamic	On	90 [W]	30 [W]	0.5 [W]	5.5	5.5	—	—
4	Type4 90 [W]	Dynamic	On	60 [W]	30 [W]	4 [W]	6	6	No	—

- **#:** Unit logical port numbers 1–6. However, while using the CLI interface, the ports are named as following:
 - interface GigabitEthernet 1/1—interface GigabitEthernet 1/4
 - interface 2.5 GigabitEthernet 1/1—interface 2.5 GigabitEthernet 1/2
- **PoE-BT Port Type:** PoE port maximum power configuration. Power to PD is shut down when PD attempts to exceed the limit.
 - Type4-90W: PoE-BT up to 90W on four pairs. Up to 45W on two pairs
 - Type3-60W: PoE-BT up to 60W on four pairs. Up to 30W on two pairs
 - Type3-30W: PoE-BT up to 30W on four pairs. Up to 30W on two pairs
 - Type3-15W: PoE-BT up to 15W on four pairs. Up to 15W on two pairs
- **Power Management Mode:** Power management configuration mode affects how PD class and power consumption affects the unit's overall free available power.
 - Dynamic: PoE port dynamic real-time power consumption is deducted from the overall PoE-free power budget, while ignoring PD class or PoE port maximum power.
 - Static: PoE port type power configuration (as Type4-90W) is deducted from the overall PoE free power budget after the PoE port is turned ON, while ignoring PD actual power consumption. Next, PD might not be turned ON when free available power is lower than PD requested power. Initial PD requested power is based on PD class and PD auto-class.
 - Hybrid: Mixture of dynamic and static power management based on PD advertising its power requirements by sending LLDP IEEE® 802.3 power through MDI TLV protocol. Every PoE port configured as Hybrid acts as if it is configured as Dynamic, if does not receive any Power Over-MDI TLV within the LLDP packet sent by the PD. After receiving IEEE 802.3 power through MDI TLV, the port also switches to Static Power mode, limiting PoE port maximum power as per the PD requested power plus user-configured cable loss based on user cable length configuration. Static PoE port maximum power might change based on PD LLDP IEEE 802.3 power through MDI TLV advertised values.
- **Status:** Reports the latest PoE port status.
 - —: PoE port is enabled. No PoE-PD.
 - On: PoE power is applied to PD.
 - Disabled: PoE is disabled (non-related to Ethernet data link state).
 - Overload: PD power consumption exceeded its maximum limit. Power is shut down.
 - Fault: Fails to turn ON the connected PD device. The following are the possible reasons:
 - Non-standard PD was connected.
 - PD class error
 - PD underload (PD power consumption is too low)
 - Shortage or invalid capacitor value
 - PD was disconnected (temporary recovery from underload)
 - PSE Fault. Not enough free power available to turn ON the PD device. Other rare possible reasons are: Power supply voltage is out of range, voltage is injected into the Ethernet port, and port over temperature.

-
- **Requested Power:** PoE PD requested power based on PD Class.
 - Class 8 = 90W
 - Class 5, 5 = 90W
 - Class 6 = 60W
 - Class 4, 4 = 60W
 - Class 4 = 30W
 - Class 3 = 15W
 - Class 2 = 7W
 - Class 1 = 4W
 - Class 0 = 15W
 - **Assigned Power:** The maximum power that was assigned to PD. Trying to consume above this limit causes the PD to be turned OFF. When enabling the Legacy PD_Class Mode, the assigned PD class might defer from the measured PD class, leading to Assigned-Power differing from Requested-Power. Assigned power might defer from requested power for the following reasons:
 - Demotion: Free available power is less than PD requested power. PoE-BT uses the demotion option to offer a lower power value to PD. If PD agrees to the lower power value, then it is turned ON with a lower power limit.
 - PoE Port maximum Power: PoE port maximum power configuration is lower than the newly inserted PD power class. For example, a 90W PD class-8 is connected to a PoE port configured as Type3-60W.
 - **Delivered Power:** Temporarily PD power consumption.
 - **Assigned Class:** PD maximum power consumption is determined by the class it is being assigned by the PoE controller (8 = 90W/5, 5 = 90W/6 = 60W/4, 4 = 60W/4 = 30W/3 = 15W/2 = 7W/1 = 4W/0 = 15W). Mostly, the PD Assigned-Class matches the PD-Measured-Class. The PD-Assigned-Class differs from the PD-Measured-Class in one of the following scenarios:
 - PoE Power Demotion: As per the IEEE 802.3bt specification, when the PoE port maximum available power is less than the PD requested power, the PoE port might offer the PD a lower maximum power value. It is up to the PD to decide to accept the new offer agreeing to consume less power.

For example, PD class-8 (90W) is being connected while PoE-Port has only 60W spare power left. Here, the port offers PoE class-6 (60W). If PD accepts the offer, then Measured-Class is class-8 while Assigned-Class is class-6.
 - Legacy PD-Class Mode = PoH. Port Mode = Plus: PoE-AT DSPD PD class 4, 4 is given 90W as if it is class 5, 5 (2×45W). PoE-AT SSPD PD class 4 is given 45W as if it is class 5.
 - Legacy PD-Class Mode = Ignore PD-Class. Port Mode =Type4-90W: Any DSPD class-x, x is given 90W as if it is class 5, 5 (2×45W). SSPD PD class-x is given 45W as if it is class 5.
 - Legacy PD-Class Mode = Ignore PD-Class. Port Mode=Type3-60W: Any DSPD class-x, x is given 60W as if it is class 4, 4 (2×30W). SSPD PD class-x is given 30W as if it is class 4.
 - **PD Measured Class:** Remote PoE-PD measured classes 1–8 for SSPD, or class 0, 0–class 5, 5 for DSPD.
 - **PD Auto Class Support:** Report if the remote PoE-BT PD device advertises that it is supporting PoE Auto Class regardless of unit Auto Class configuration. When enabled and supported by the PoE-PD device, PoE port maximum power allocation is determined by the power consumed by PD during the Auto Class negotiation phase instead of the PD class.
 - **PD Requested Power over LLDP:** When supported by remote PoE-PD, report remote PoE PD requested power using LLDP Power Over-MDI. If PoE-LLDP is disabled, (N/A) appears to the right of PD request power, ignoring PD request power using only PD class for determining PoE power request. When PoE-LLDP is enabled, PD PoE power request over LLDP replaces the PoE PD class. However, it never exceeds the PD class maximum power. Cable loss based on cable length configuration is added on top of PD LLDP requested power. PoE power management configuration mode controls how much power is deducted from unit-free available power.

3.1.5 System—Status

The following table lists the system power specifications.

Table 3-6. System—Status

Item	Value
Total power usage	8 [W]
Total Allocated power	8 [W]
Free available power	143 [W]
power supply voltage	53.5 [W]

- **Total Power Usage:** Total power consumption by all PoE ports.
- **Total Allocated Power:** Total power allocated to all active PoE ports. PoE port power management mode configuration influences the total allocated power
- **Free Available Power:** The free available power left to power additional PoE ports, or before turning OFF an active PoE PD due to lack of free available power.
- **Power Supply Voltage:** PoE power supply voltage.

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If you encounter any problems while installing or using this product, consult the Microchip technical support team through the website or contact on the following number:

USA/Canada

Telephone: +1 877 480 2323

Internet: www.microchip.com/support

5. Revision History

The revision history describes the changes that were implemented in the document. The changes are listed by revision, starting with the most current publication.

Revision	Date	Description
A	12/2022	Initial Revision

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