

Operations Manual



PDT-NSU-7216-PA-SF-R

Revision 1.0 – April 2022



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2. Abbreviations

Abbreviation	Description
AC	Alternating Current
AI	Artificial Intelligence
AP	Access Point
IEEE	Institute of Electrical and Electronic Engineers
IP	Internet Protocol
MTBF	Mean Time Between Failures
PD	Power Device
PoE	Power over Ethernet
PSU	Power Supply Unit
QoS	Quality of Service
SFP	Small Form-factor Pluggable
VLAN	Virtual Local Area Network

3. Safety Information

3.1 General Safety Information

WARNING

Only trained and authorised personnel should be permitted to work on this equipment. It is assumed that those using this guide are competent to work on equipment of this nature and will take appropriate precautions when working with the fault analysis guide.

Parallax Digital Technologies accepts no responsibility for any injury or loss caused by unsafe or inadequate working practices, or for work carried out by an unauthorised third party.

To prevent possible danger, damage, and bodily harm when handling the equipment, please observe all warnings, cautions notices contained in this section.

Failure to heed the following danger, warnings, and cautionary statements could lead to serious injury or death.

3.2 Mains Supply

WARNING

The Unit should be mains-fed using the supplied AC Power Lead, which is fitted with a 3A Fuse. If the device is to be fed from an alternative power source, then the appropriate circuit protection device should be used to ensure that the supply circuit is interrupted, in the event that a fault in the device causes too much current to flow into it, causing an unsafe condition.

3.3 Fibre-Optic Ports

DANGER

This device incorporates Fibre Optic transmission ports – under no circumstance should anyone look directly into these ports, as this may cause temporary or permanent damage to the users' eye(s).

3.4 'Hot' PoE Ports

WARNING

This switch is a Passive PoE device which means that the PoE power is continuously supplied to the RJ45 Connector and there is no handshake process that must complete before power is applied to the ports, as with IEEE 802.3af and IEEE 802.3at compatible devices. Designers and operators should ensure that all devices are compatible with this type of connection method.

The output voltage of the PoE ports is fixed at +24VDC to meet the requirements of specific peripherals and this switch does not provide +48VDC as per the IEEE 802.3af and IEEE 802.3at standards.

4. Packing List

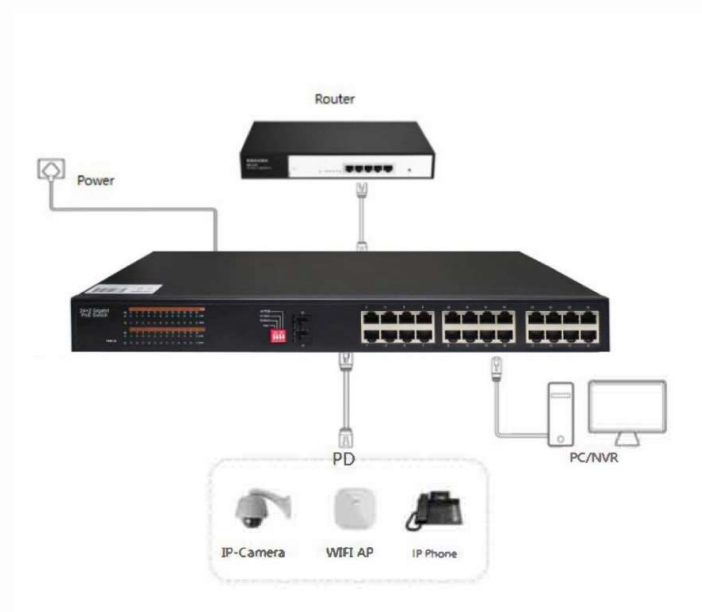
The following items are included in the shipping carton:

- 1 x PDT-NSU-7216-PA-SF-R Unmanaged Rackmount 16 Port Passive PoE Switch
- 1 x Rackmount Kit
- 1 x Mains AC Power Lead
- Operation & Maintenance Manual
- Declaration of Conformity

5. Product Overview

The PDT-NSU-7216-PA-SF-R is an Unmanaged Gigabit AI Passive PoE switch, providing 16 x 10/100/1000 PoE (Hot +24VDC) ports and 2 x Gigabit SFP ports for connectivity, designed to directly connect to devices such as IP Cameras, Wireless APs, IP Telephones etc.

A typical application setup can be seen in the following diagram – note the setup shows the 24 Port Version of this product line:



This PoE Switch has 4 Mode Options available:

- AI VLAN Mode
- AI Extend Mode
- AI Power Supply Mode
- AI QoS Mode

5.1 AI VLAN Mode

With AI VLAN Mode selected, Ports 1-16 are isolated from each other; all ports are only able to communicate with the Uplink ports when this option is enabled. This can be useful when the network setup requires multiple clients to connect to a common resource but are specifically not required to communicate with each other. This can reduce the effect of network storms, and can improve network security resilience.

5.2 AI Extend Mode

With AI Extended Mode Selected, the effective transmission distance is increased from 100m to 250m, but the port speeds are reduced to 10Mbps; this limitation does not affect the uplink ports. The AI Extend Mode is also suitable where the power source is too far away for conventional configurations, but the bandwidth limitation should not be overlooked when incorporating this feature into network designs.

5.3 AI Power Supply Mode

AI Power Supply Mode allows the switch to check the ports periodically, for network activity. If a port is not passing traffic for a period of time, the switch will automatically power cycle the PoE supply for that port. The PD will then reboot and return to a functioning state, if it had failed or locked up. This is an ideal feature which can be used to automatically manage unstable peripherals, without the need for a site visit to recycle the device.

5.4 AI QoS Mode

When AI QoS is enabled, all ports will prioritize video and VoIP traffic over other types. For example, in heavy network traffic, an IP Camera stream will be prioritized over a server backup stream, which may be essential for security or CCTV systems, where the integrity of the video signals is paramount.

6. Connectors and Configuration Options

Front Panel



6.1 LED Indicators

The Front Panel LEDs display the status of the switch and the associated port connections as indicated in the table below:

LED	Name	Colour	State	Status
PWR	Power	Green	OFF	Unit Power Off
			ON	Unit Power On
LNK	Link	Green	OFF	No Connection
			ON – Steady	Connection
			ON – Flashing	Data Tx/Rx
SPD	Port Data Rate	Green	OFF	10/100 Mbps
			ON	1000 Mbps

6.2 Mode Selection Switches

The Mode Selection Switches toggle AI functionality modes as follows:

- AI VLAN Mode – Isolates Ports 1-16 from each other for traffic purposes
- AI Extend Mode – Increases effective range to 250 but only at 10Mbps data rate
- AI Power Supply Mode – Monitors ports for device lock up and auto-cycles PoE power
- AI QoS Mode – Prioritization of Video and VoIP traffic under high data throughput conditions

6.3 SFP Ports

The Front Panel has 2 x Gigabit SFP Ports, allocated as Port 17 and Port 18, which can accept all standard 1000 BASE-FX SFP Modules, for Uplink Connectivity.

6.4 RJ45 Ports

The Front Panel incorporates 16 x 10/100/1000Mbps Passive PoE Ports (+24VDC) to allow connectivity to a range of suitable peripherals. PoE Power is provided on the RJ45 pins as follows:

Pins	Type
4/5	+24VDC
7/8	GND

Rear Panel



6.5 GND Terminal

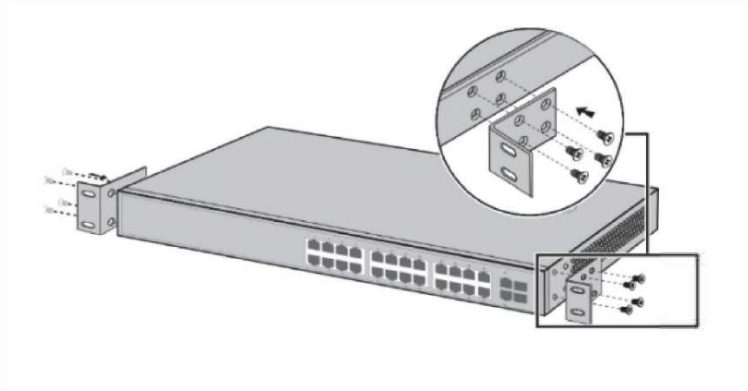
The Unit incorporates an external GND terminal to supplement the Ground Pin on the IEC C14 connector, to allow units to be connected directly to a GND Busbar when used in Equipment Rack Configurations.

6.6 AC Inlet

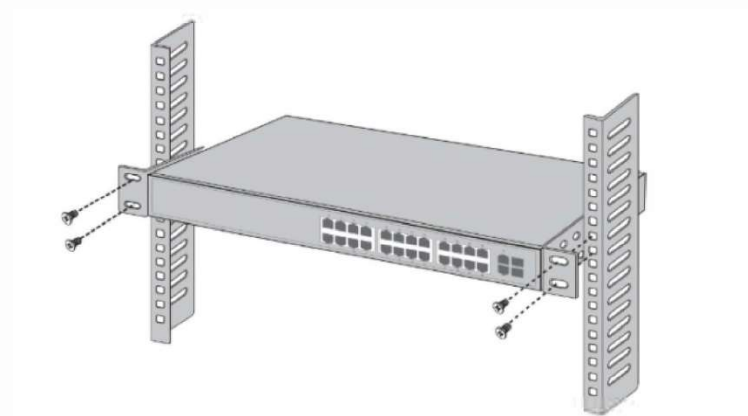
The Unit accepts AC Mains Power across the range 100-240VAC via an IEC C14 inlet.

7. Installation Procedures

This device may be used on a desk-top or it can be installed in a 19" rack enclosure. Before installation into a rack enclosure, the 2 x L-Shaped brackets from the kit pack should be fitted to the sides of the unit as shown in the illustration below.



Once the brackets are securely fitted, the unit should be positioned so that the mounting holes in the brackets are aligned to the rack holes. The unit should then be secured using captive fixings, to ensure the device is secured in the rack assembly. Note – if you are using the rear GND terminal, then you may have to attach your Ground Cable before installing the unit into the rack, depending upon whether or not your rack has an open rear access panel or door.



8. Connection and Setup

8.1 Inspection Checks

Please inspect the unit to ensure that there is no damage to the external casing which could cause a malfunction of the device or cause a safety critical fault. Any damaged units should be returned to Parallax Digital Technologies for inspection and testing.

Please ensure that the AC lead is correctly fitted and secured, and if an additional Earthing Cable is to be used, that it is secured onto the GND Connector on the rear of the unit before use

8.2 RJ45 Connections

Ensure all required RJ45 Ports are connected correctly using CAT5e cable or better to the client devices. Note that +24VDC will be present on the voltage carrying pins continuously, and users should check that all PoE powered devices to be used are compatible with +24VDC supply voltage.

8.3 SFP Connections

The SFP Ports incorporated into this unit only support Gigabit SFP Modules – it is recommended to use standard SFP Modules in this product.

Once an SFP Module is fully inserted and locked in place, please ensure the fibre cables are connected to the correct Tx/Rx points. If using an SFP-RJ45 adapter, then ensure the connector is fully inserted and locked into the adapter.

8.4 Power Up

The Unit will automatically power up as soon as AC Voltage is applied to the mains cable. The Power Light will be illuminated and after approximately 1 second, all of the other LEDs will flash on and off to complete the initialization sequence. Following this, the Port Status LEDs will display the current state of each of the ports.

9. Hardware Specification

ETHERNET

Standards	IEEE 802.3 Ethernet IEEE 802.3u Fast Ethernet IEEE 802.3ab Gigabit Ethernet IEEE 802.3x Full Duplex Flow Control IEEE 802.3af Mode B – Passive PoE IEEE 802.1Q VLAN Tagging
Forwarding and Filtering Rate	14,880pps (10Mbps) 148,800pps (100Mbps) 1,488,000pps (1000Mbps)
Packet Buffer	4Mbits
Packet Length MAC Address Table	10KB
Exchange Property	8K
	Backplane Bandwidth 56Gbps Packet Forwarding Rate 47.616Mbps

INTERFACE

Wired	16 x RJ45
Optical	2 x SFP 1000 BASE-X or 100 BASE-FX

PoE

Standard Port	IEEE 802.3af Mode B RJ45
Power Pin Assignment	4/5 (+) 7/8 (-)
PoE output	+24VDC
PoE Budget	300W Max

ENVIRONMENTAL

Operating Temperature	0°C to +50°C
Storage Temperature	-10°C to +70°C
Relative Humidity	5% - 95% non-condensing
MTBF	500,000 hours

ELECTRICAL

Operating Voltage	100-240vac
Power Consumption	15w Without PoE Load
Short-Circuit Protection	Auto-Reset
Reverse Polarity	Protected

MECHANICAL

Dimensions	440mm x 395mm x 45mm
Weight	3.6kg
Casing	Aluminium
Mounting	Rackmount – 1U

INDICATORS

PWR	Power
LNK	Link/Activity
SPD	Data Transmission Speed

CERTIFICATION

Electrical Safety	EN 62368-1:2020+A11:2020
Emissions	EN 55032:2015+A1:2020
Radiated Immunity	EN 55035:2017+A1:2020
Harmonic Emissions	EN 61000-3-2:2014
Fluctuations and Flicker	EN 61000-3-3:2013
Electro-Static Discharge	EN 61000-4-2:2009
Electromagnetic Field Immunity	EN 61000-4-3:2010
Electrical Fast-Transients	EN 61000-4-4:2012
Surge	EN 61000-4-5:2014+A1:2017
Conducted Immunity	EN 61000-4-6:2014
RoHS	IEC 63000:2018

For all technical enquiries regarding this product, please contact our technical support team using the following email address:

support@parallaxdigital.co.uk