Operations Manual

PDT-NSU-0416-SF-I

Revision 1.0 – August 2022

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1. Revision History

Date	Rev	By	Comments	Checked	Date
20/09/2022	01	JF	Initial Release	SC	22/09/2022

2. Abbreviations

Abbreviation	Description
AP	Access Point
CCA	Copper Clad Aluminium
DC	Direct Current
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

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.

All devices should be inspected upon receipt for signs of physical damage, which may in turn, affect operational performance, or the overall safety of the unit. Any damaged items should be returned to Parallax Digital Technologies Ltd for safety checks.

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 DC Power Supply

⚠WARNING

The Unit should be mains-fed using a DC Power Supply using an appropriately rated cable assembly, which is protected internally at the power supply device itself. 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 user's eyes.

4. Packing List

The following items are included in the shipping carton:

- 1 x PDT-NSU-0416-SF-I Unmanaged Ethernet Switch
- 1 x DIN Rail Mounting Kit (Fitted)
- 1 x Wall Mounting Kit
- Operation & Maintenance Manual (May be electronically supplied)
- Declaration of Conformity (May be electronically supplied)

5. Product Overview

The PDT-NSU-0416-SF-I is a Small Form Factor Industrial Unmanaged Network Switch, supporting 16 x 10/100 BASE-T RJ45 Ports, and 4 x 100/1000 BASE-FX SFP Ports.

This model is designed for a nominal +24VDC Power Supply but can operate on input voltages from +9-36VDC. It is ideal for use in applications that require larger numbers of access ports, where there is not a requirement for PoE.
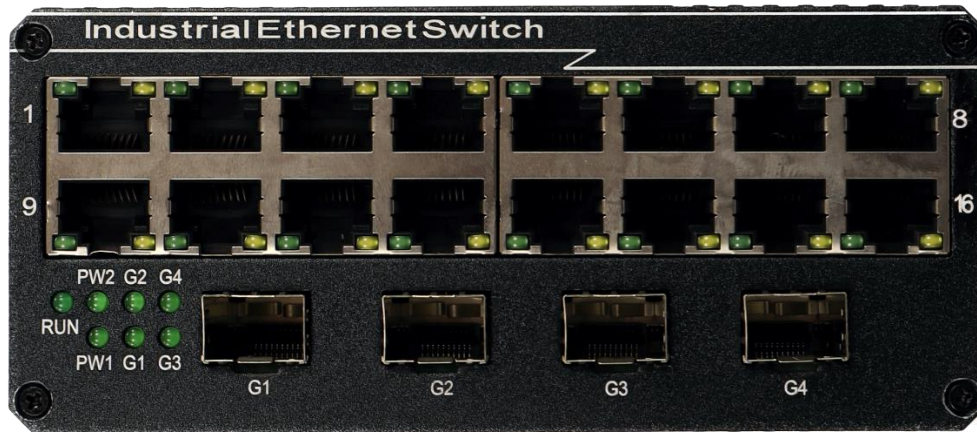
The device is designed for use in harsh industrial environments, and incorporating a rugged aluminium housing, it can be operated across a wide temperature range (-40°C to +80°C) making it suitable for most conditions.

A typical application setup can be seen in the following diagram:
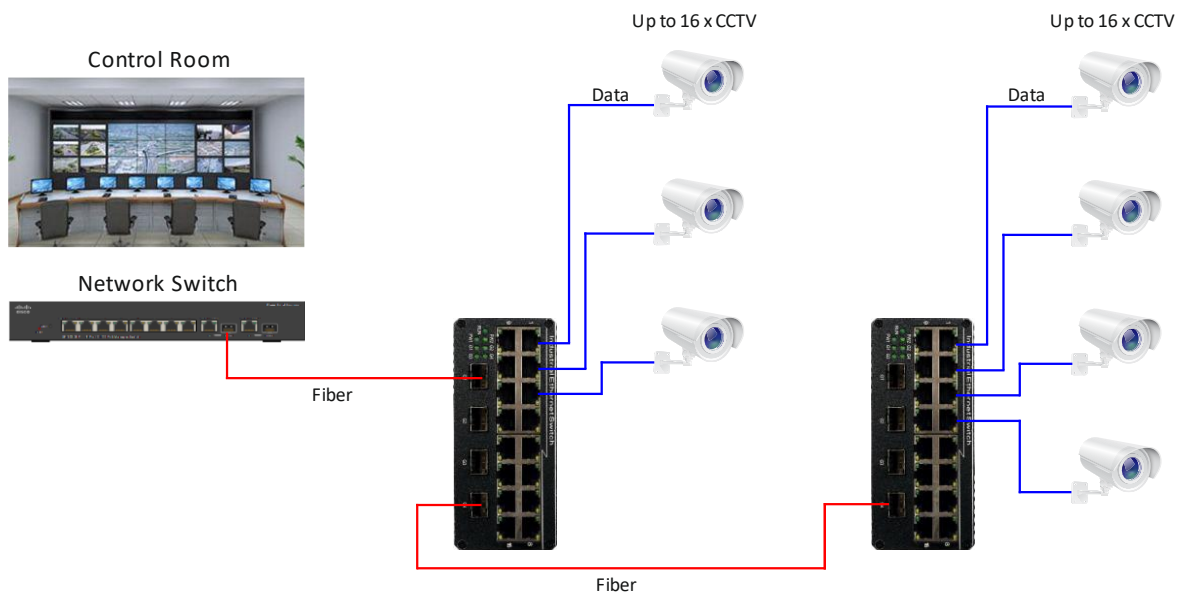
6. Connectors and Indicators

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
PW 1/2	Power Source 1/2	Green	OFF	Power Not Avail
			ON	Power Available
G1-G4	Gigabit Fiber Port	Green	OFF	No Connection
			Flashing	SFP Connected
RUN	System Status	Green	OFF	Not Running
			ON	Running
Port LEDs	Port Connection	Green	OFF	No Connection
			ON	Port Connected
	Data Tx/Rx	Yellow	OFF	No Data Tx/Rx
			Flashing	Data Tx/RX

6.2 RJ45 Ports

The Front Panel has 16 RJ45 Ports and which are all 10/100 BASE-T Ports – note that these are not PoE capable ports. All of the RJ-45 ports are auto MDI/MDI-X compatible and can operate in Full/Half Duplex Modes via auto-negotiation. The remaining 4 ports are 100/1000 BASE-FX SFP Ports and accept a range of SFP modules.

6.3 Power Supply Connector
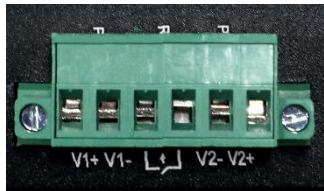
| Pin	Symbol	Function
1	V1+	Power Input 1 Positive Input
2	V1-	Power Input 1 Negative Input
3	S-1	Not Used
4	S-2	Not Used
5	V2-	Power Input 2 Negative Input
6	V2+	Power Input 2 Positive Input

The device is designed to operate with a dual redundant power supply feed which means that this may utilize a backup battery power source. With a single power source connected, the device will operate on this source. With 2 power sources connected, the device will take power from the highest input voltage source and will not move over to the second source unless the primary source fails, or the primary source voltage drops below that of the second source.

The case also has an additional earthing terminal which should be connected to an external field ground source.
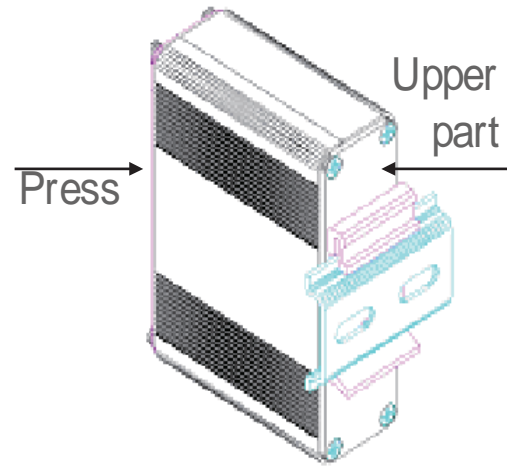
Note: All Power Supplies should provide over-current and short-circuit protection and should have a capacity rating to meet the required output current for the device.

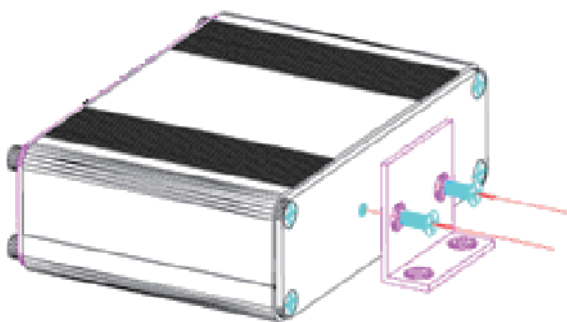# 7. Installation Procedures

7.1 DIN Rail Installation
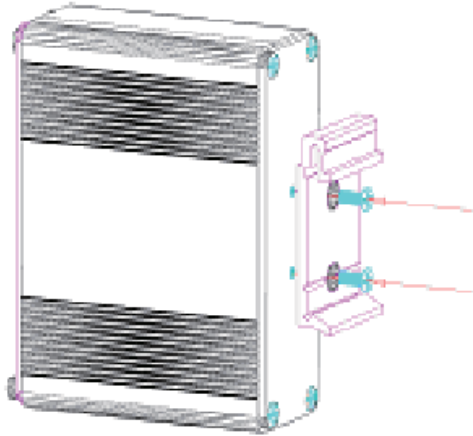
Attach the DIN Rail Bracket (if not fitted) to the switch case using the screws supplied
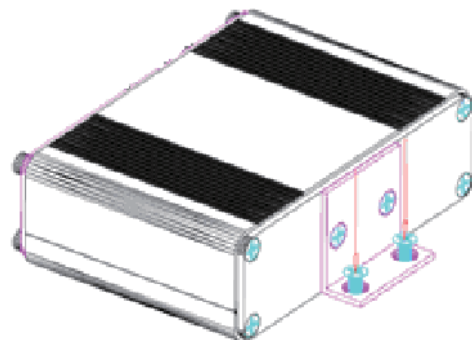
Press
Upper part

Clip the upper edge of the bracket onto the DIN Rail and push to latch the bottom strip

7.2 Wall Mount Installation

Attach the Wall Mount Bracket (if not fitted) to the switch case using the screws supplied

Mount the switch to the required surface using appropriate fixings

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 DC Cables are securely fastened in the terminal block, and that the terminal block is correctly inserted into the switch power connector housing.

8.2 RJ45 Connections

Ensure all required RJ45 Ports are connected correctly using CAT5e cable or better to the client devices. The Uplink port should be connected to the host device or network, and the access ports TP1-4 are available for other devices or connections. All cables should be solid copper and not CCA.

8.3 SFP Port Connections

Ensure that the SFP sockets are clear from any dirt or contamination and that any required SFP Modules are installed into the unit before applying power and care should be taken not to look directly into any open port once power is applied. It is recommended to leave port blanks fitted when not in use. Only compatible SFP modules should be installed in the unit and the maximum data thoughput for ports G1-G4 is 1000Mbps.

8.4 Power Up

The Unit will automatically power up as soon as DC power is applied to the device. All LEDs will flash briefly to complete the initialization sequence, then the RUN LED and the Appropriate Power LEDs will be lit. Following this, the Port Status LEDs will display the current state of each of the ports.

9. Physical Dimensions

60

138

112
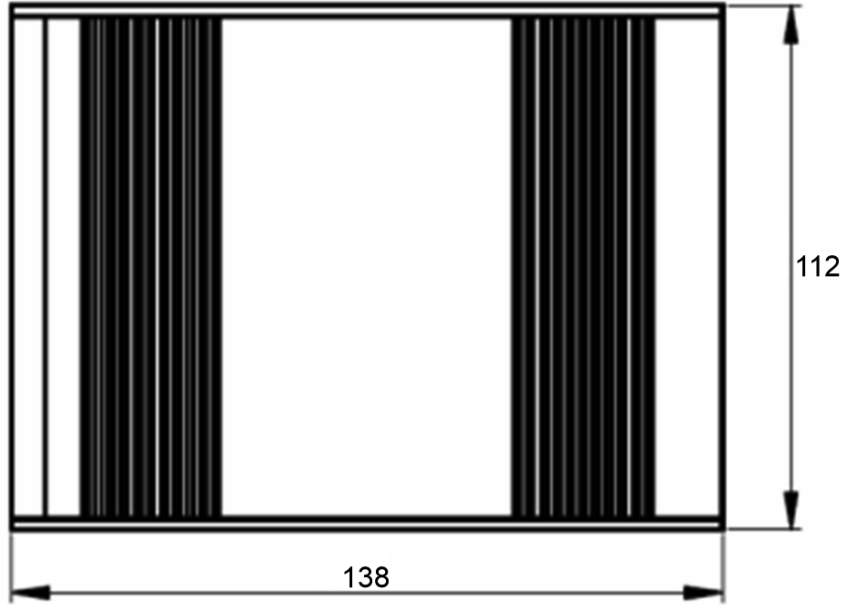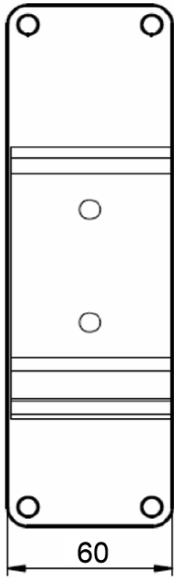
All Dimensions are in mm

10.   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 802.3az Energy Efficient Ethernet
Forwarding and Filtering Rate	14,880pps (10Mbps)
	148,800pps (100Mbps)
	1,488,000pps (1000Mbps)
Packet Buffer	1Mbits
Packet Length	10KB
MAC Address Table	2K
Exchange Property	Backplane Bandwidth 20Gbps
	Packet Forwarding Rate 14.88Mbps

INTERFACE

Wired	16 x 10/100 BASE-T RJ45
Fiber	4 x 1000 BASE-FX SFP

ENVIRONMENTAL

Operating Temperature	-40°C to +80°C
Storage Temperature	-40°C to +85°C
Relative Humidity	5% - 95% non-condensing
MTBF	>100,000 hours

ELECTRICAL

Operating Voltage	+24VDC (9-36) (Terminal Block Connector)
Power Consumption	7W
Short-Circuit Protection	Auto-Reset
Reverse Polarity	Protected

MECHANICAL

Dimensions	138mm x 112mm x 60mm
Weight	670g
Casing	Aluminium
Mounting	DIN Rail & Wall Mount

INDICATORS

PW	Power
G1-4	SFP Connection Status
RUN	System Operational
Ports	Port Status

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
Power Frequency Magnetic Field	EN 61000-4-8:2010
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