

NET-429

Network Switch

Industrial TSN and 1588v2-Enabled with PoE-PD Support, 8x RJ45 and 2x SFP Ports

Product Manual



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Before You Begin

Review the warnings in this section and the best practice recommendations when using and handling the NET-429. Following these recommendations provides an optimal user experience and prevents damage. Read through this document and become familiar with the NET-429 before proceeding.



FAILING TO COMPLY WITH THESE BEST PRACTICES MAY DAMAGE THE NET-429 AND VOID YOUR WARRANTY.

Warnings

Only qualified personnel should configure and install the NET-429. While observing best practices, pay particular attention to the following.



Avoid Electrostatic Discharge (ESD)

Handle the circuit board and other bare electronics when electrostatic discharge (ESD) protection is in effect. Having a wrist strap and a fully grounded workstation is the minimum ESD protection required before the ESD seal on the product bag is broken.



Avoid Laser Light

The Optical Fiber ports emit Laser Light. Use caution when connecting Optical Fiber connectors. Direct exposure to this emission can cause permanent eyesight damage.

Introduction

This manual provides installation and power up information for the NET-429. For further information, contact Technical Support at (817) 274-7553, Monday through Friday, between 8 AM and 5 PM Central Standard Time(CST).

Refer to the WinSystems website at <http://www.winsystems.com> for other accessories that can be used with the NET-429.

Functionality

The NET-429 board is an industrial Gigabit Ethernet switch featuring IEEE 802.1 TSN support, redundant power inputs, and support for wide operating conditions. With 10 ports (8x RJ45 and 2x SFP) supporting full non-blocking bandwidth, the NET-429 is designed for rugged industrial applications which need performance, reliability, and timing precision.

Triple redundant Power input supports dual wide range 9-36 VDC inputs as well as a Power over Ethernet PD power input on Port 1. (PoE PD, IEEE 802.3at, Type 1)

For reliability, the NET-429 has no fans and no moving parts. For ease of deployment, no setup configuration or remote management is required or supported. Pre-threaded mounting points are located in typical DIN Rail mount configuration, and all indicator lamps are on the face of the unit.



Features

WinSystems' NET-429 is a small form factor, low power, rugged design, with extended operational temperature which make it a great fit for rugged embedded systems in the industrial control, transportation, energy, and industrial IoT markets.

The NET-429 provides the following features.

- 10-Port Layer-2 Gigabit Ethernet Switch (8x RJ45, 2x SFP)
- Triple redundant power connections (2x DC, 1x PoE PD)
- Precision Timing Support (TSN, AVB, 1588 PTP)
- Wide Power and Temperature operating conditions

Network Ports

- 8 - 1000BASE-T RJ45 Copper ports
- 2 - 1000BASE-X SFP Optical Fiber ports

Flexible Power Requirements

- Triple redundant power input
- 2 - Wide Range 9-36V DC input (auto-switching)
- 1 - 4 Pin Screw Terminal Block Connector for VDC
- 1 - PoE PD Power Input Port (Ethernet port 1)

Mounting

- DIN Rail mounting configuration
- Mounting Kit

Surface

- Black powder insulating coating
- Airflow vents positioned for horizontal or vertical installation
- Fanless operation

ESD

- Electro-Static Discharge (ESD) hardened.
- Compliant with IEEE standards

Specifications

The NET-429 adheres to the following specifications and requirements.

Technical Specifications

CONNECTIVITY	<ul style="list-style-type: none"> • High performance, non-blocking, 10-port Ethernet Switch • Eight 10/100/1000Mbps RJ-45 Ports with Advanced Virtual Cable Tester (VCT) diagnostic features • Two 1000Base-X SGMII SFP ports • Low power Energy Efficient Ethernet PHYs
TIME CRITICAL DATA	<ul style="list-style-type: none"> • IEEE 802.1 Time Sensitive Networking (TSN) support • IEEE 802.1 Audio Video Bridging (AVB) support • Supports IEEE 1588v2 one-step PTP • Synchronous Ethernet for 1000Base-T or 100Base-TX • Cut-through switch fabric for low latency applications
QUALITY OF SERVICE (QoS)	<ul style="list-style-type: none"> • QoS support with 8 traffic lanes <ul style="list-style-type: none"> ◦ IEEE 802.1P ◦ By port ◦ Source or Destination MAC address ◦ IEEE 802.1Q VLAN ID ◦ Frame Type ◦ IPv4 Type of Service (TOS) ◦ Differential Service ◦ IPv6 Traffic Class • IEEE 802.1Qbb Priority Flow Control
SECURITY	<ul style="list-style-type: none"> • Marvell® Link Street® 88E6390X Switch <ul style="list-style-type: none"> ◦ Integrated 200MHz microprocessor • Three levels of IEEE 802.1Q security supported • Supports 4096 802.1Q VLANs • Supports 802.1D/s/w Spanning Tree Protocols • IPv4 IGMP and IPv6 MLD snooping • IEEE 802.1x MAC Authentication
ADVANCED SWITCHING CAPABILITY	<ul style="list-style-type: none"> • High performance switch fabric • Simultaneous line rate switching <ul style="list-style-type: none"> ◦ Up to 16K MAC addresses • 256 Entry TCAM for Deep Packet Inspection <ul style="list-style-type: none"> ◦ Look up to 48 or 96 bytes deep into a frame • Per port ingress rate limiting and broadcast storm prevention • Per port rate shaping
POWER	<ul style="list-style-type: none"> • Three redundant power inputs for reliable operation <ul style="list-style-type: none"> ◦ Input 1 and 2: Wide Range 9-36V DC input ◦ Input 3: PoE PD 802.3 at Type 1 • Typical Power is 6 Watts with Max Power of 13 Watts • Overload Protection

Technical Specifications

ENVIRONMENTAL	<ul style="list-style-type: none">• Fanless -40C to 85C Operating Temperature Range• Shock Tested per IEC-60068-2-27 @ 4G rms• Vibration Tested per IEC-60068-2-6 @ 2G rms• Mean Time Between Failure (MTBF) 224604 hours (MIL217F)
COMPLIANCE & CERTIFICATION	<ul style="list-style-type: none">• FCC Class B / CISPR Class B• CE stamp• REACH and RoHS Compliant
MECHANICAL	<ul style="list-style-type: none">• Dimensions: LxWxH = 9.17in x 4.10in x 1.72in (233mm x 104mm x 44mm)• Weight: 1.5lbs (680gr)• Optional DIN Rail Mount

Configuration

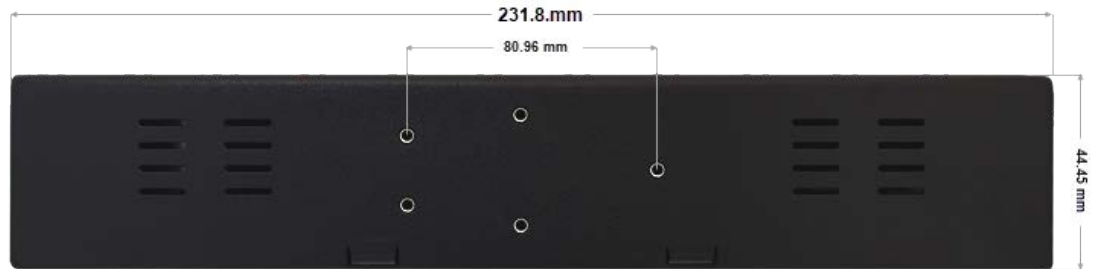


Front view components

Item	Description
PWR	Power on indicator light.
PoE	Power over Ethernet (PoE) indicator light.
PoE-PD	Ethernet Port 1 allows PoE input.
10/100M Link Act	Label showing 10/100 Mb, LINK, and ACT. Orange indicates 10/100 Mb transfer rate. Steady orange indicates Ethernet connection. Flashing orange indicates activity over Ethernet connection.
1000M Link Act	Label showing 1000 Mb, LINK, and ACT. Green indicates 1000 Mb (1 Gb) transfer rate. Steady green indicates Ethernet connection. Flashing green indicates activity over Ethernet connection.
1-8	Standard or shielded RJ-45 Ethernet connectors
9-10	SFP Optical Fiber connectors.
Connector	Screw Release Terminal Connector. 4 wire.

Physical Dimensions

Rear View



Front View



Left Side View



Installation

This section describes the NET-429-10-00 installation.

Tools Required

- Screw Driver, Phillips-Head #2
- Screw Driver, Flat Head 3 mm
- Wire stripper

Materials Used

- Required:
 - Power Supply, 9-36 VDC
- Optional:
 - Mounting Kit for DIN RAIL N429-MOUNT-KIT
 - Mounting Clip, 4 Screws, 4 Washers

Mounting Preparation

1. Locate an appropriate position for the NET-429
2. Ensure the position is not exposed to weather, heavy dust or debris.
3. Remove the NET-429 from the package.
4. Inspect all parts for damage.
5. Use a 3 mm flat head screw driver to remove the power connector from the NET-429 left side. (Set aside for use below)

Attaching the DIN Clip (optional)

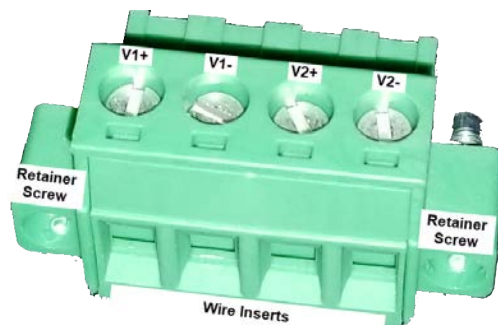
1. In the NET-429 Mounting Kit, remove the clip and screws
2. Position the clip on the rear of the NET-429 to align with pre-drilled screw holes.
3. Insert the Phillips head screws in the holes and hand tighten.
4. Attach the DIN clip to the DIN rail.

Attaching a Power Supply

1. Ensure the power supply selected has the appropriate output. It should supply 9-36 VDC and support 13 watts minimum.
2. Unwrap the power supply cable.

Note: Make sure the Power Supply is not connected to main power.

3. The output wire should have no connector attached. If needed, use the wire stripper to clip off the connector.
4. Strip approximately 10mm of insulation from the + and - wires.
5. Ensure the conductors are twisted. Use terminal pins if desired.
6. Remove the Terminal Connector (shown below) from the input power connector.
7. Use the 3 mm flat head and loosen the V1+ and V1- terminals.
8. Insert the bare wires into the appropriate positive (V1+) and negative (V1-) wire insert holes.
9. Tighten the V1+ and V1- terminals hand tight.



10. If using a second power supply, repeat the steps above, with V2+ and V2- terminals
11. Insert the Terminal Connector into the input power connector header.
12. With the 3 mm flat head screwdriver, tighten the two retainer screws.

Power Up Test

1. Power up the source power supply.

The PWR indicator light on the front of the NET-429 should blink then show steady.

WARNING: DO NOT look into ports 9 and 10. Laser light could damage your eyesight when using optical SFP modules.

2. Ensure the power supply cables are safely routed and secure.

Power Up with PoE Only

If your network environment supports PoE, the NET-429 can be fully powered by Ethernet RJ-45 connection to Port 1.

Port 1 will operate as a functional Ethernet network connection and accept power in. (There is no power output on Port 1.)

This feature can be used as a sole source or as a redundant source of power if needed.