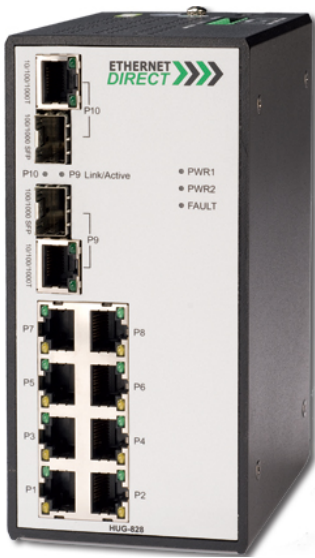


HUSKY

HUG-828(E)



Industrial 8 10/100Base-T(X) +
2 Copper/SFP

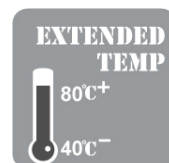
Gigabit Unmanaged

Ethernet Switch

User's Manual

V2.0

7-24-2009



**Husky Series Industrial Ethernet Switch Solutions
HUG-828(E) Industrial Gigabit Unmanaged Switch
User's Manual**

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Chapter 1

Introduction

Welcome to Husky Series HUG-828(E) Industrial Gigabit Unmanaged Ethernet Switch. This chapter includes the following topics:

- Overview
- Product Features
- Package Checklist

1-1 Overview

The Husky Series HUG-828(E) is a highly reliable Industrial 10-port Gigabit Unmanaged Ethernet Switch. It supports state of the art design with eight 10/100Base-T(X) Ethernet ports and two small form pluggable (SFP) ports that support Gigabit SX or LX depending on your existing network structure. The innovative SFP fiber slot design provides users with the flexibility to insert different fiber modules, either multi-mode or single-mode at various distances, whether you require typical 10km or overhaul 40km, 80km, 120km distances. The HUG-828(E) is equipped with a terminal block to provide dual power inputs with reverse polarity protection. Its IP-30 housing protection, wide operating temperature of -10 to 70°C and DIN-Rail mounting is suitable for an industrial environment.

1-2 Product Features

HUG-828(E) has the following features:

High Performance Network Switching Technology

- Complies with IEEE 802.3, IEEE 802.3u, IEEE 802.3x, IEEE 802.3ab, IEEE 802.3z
- Provides 8 x 10/100Base-T(X) Ethernet ports with RJ-45 connector
- Provides 2 combo ports
- RJ-45 ports support auto MDI/MDI-X crossover
- Provides broadcast storm protection

Robust Industrial Design

- Robust aluminum case complying to IP-30 housing standard
- Supports operating temperature -10 to 70°C
- DIN-Rail, wall mounting installation
- High level of immunity to electromagnetic interference & power supply surges typically found in industrial plant environments or external curb side enclosures

Reliable Power Design

- Wide range redundant power design
- Equipped with redundant power inputs
- Supports 12 to 48VDC redundant power with polarity reverse protection
- Supports 6000VDC Ethernet ESD and 3000VDC EFT protection
- Removable terminal block

1-3 Package Checklist

HUG-828(E) is shipped with the following items:

- 1 x Husky Series HUG-828(E) Industrial Gigabit Unmanaged Ethernet Switch
- 1 x User's manual
- 2 x wall-mounting plates and 6 x screws
- 1 x DIN-Rail mounting kit (attached to the HUG-828(E)'s back panel by default)

Chapter 2

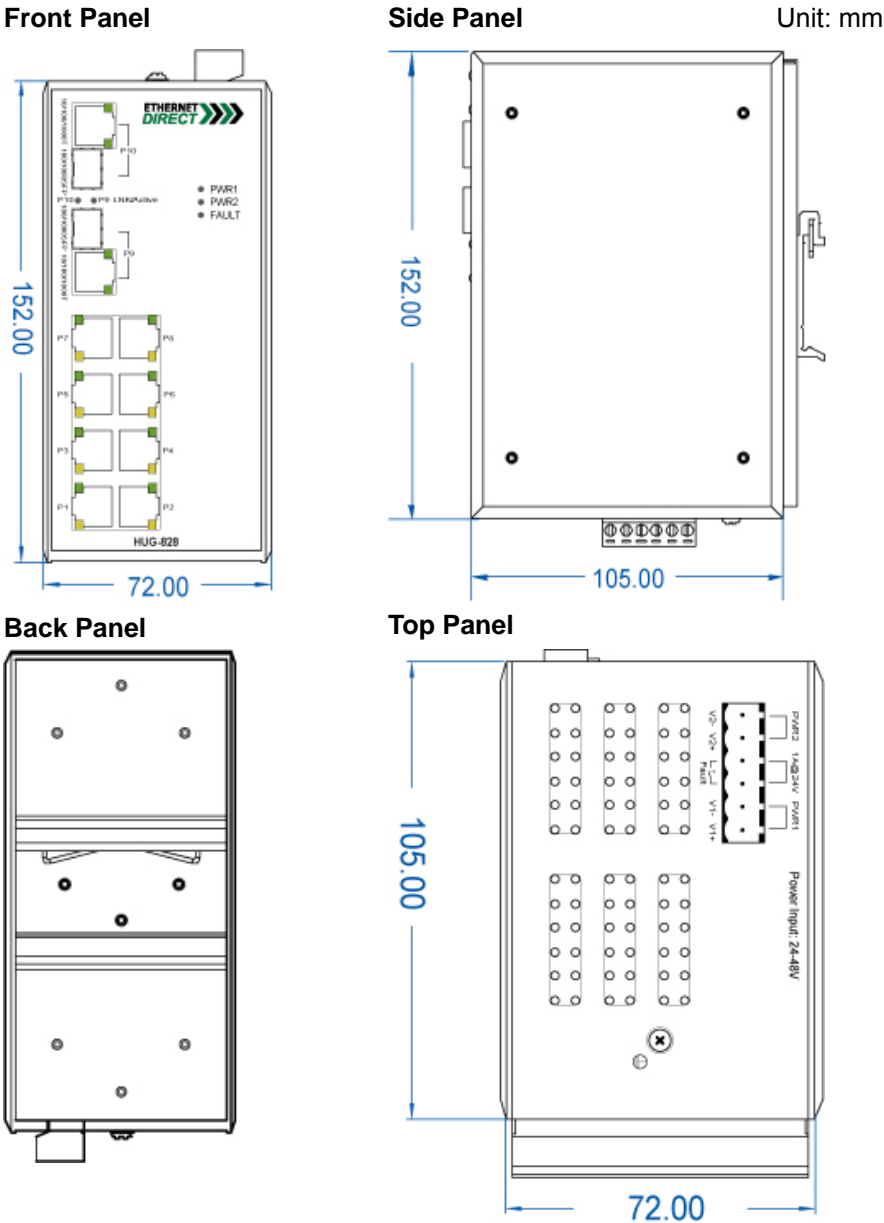
Hardware Installation

This chapter contains information on HUG-828(E)'s dimensions and hardware installation. Topics include:

- Dimensions and Panel Layout
- LED Indicators
- RJ-45 Ports
- SFP Ports
- Installing Your Ethernet Direct Switch

2-1 Dimensions and Panel Layout

Dimensions of HUG-828(E) Industrial Gigabit Unmanaged Switch are 72mm (W) x 105mm (D) x 152mm (H).



2-2 LED Indicators

There are diagnostic LEDs located on the front panel of HUG-828(E). They provide primary information on switch status as described in the table below.

LED Name	LED Color	LED Function
PWR1	Green	Power is on.
	Off	Power is off or no power is being supplied to the switch.
PWR2	Green	Power is on.
	Off	Power is off or no power is being supplied to the switch.
Fault	Red	PWR1 or PWR2 fails.
	Off	Both power inputs are on, or no power is being supplied to the switch.
LNK/ACT	Green	The fiber port is linked.
	Blinking	The port is transmitting or receiving packets.
	Off	The port is not connected to a network.
P9-P10 (upper LED)	Green	The port is connected to a network
	Blinking	The port is transmitting or receiving packets.
	Off	The port is not connected to a network.
P9-P10 (lower LED)	Green	The port is linked at speed of 1000Mbps.
	Off	The port is disconnected or is operating at speed of 10/100Mbps.
P1-P8 (upper LED)	Green	The port is linked.
	Blinking Green	The port is transmitting or receiving packets.
	Off	The port is not linked.
P1-P8 (lower LED)	Orange	The port is operating in full duplex mode.
	Blinking Orange	Collision of packets occurs.
	Off	The port is operating in half duplex mode, or not linked to a network.

2-3 RJ-45 Ports

HUG-828(E) has 8 10/100Base-TX auto-sensing ports for 10Base-T, or 100Base-TX device connections. The UTP ports can auto-sense for 10Base-T, or 100Base-TX connections. Auto MDI/MDIX function allows HUG-828(E) to connect to another switch or workstation without changing straight through or crossover cabling. See **Cabling** section for straight through and crossover cable schematic.

2-3.1 RJ-45 Pin Assignments

RJ-45 pin assignments as described in the table below:

Pin Number	Assignment
1	Tx+
2	Tx-
3	Rx+
6	Rx-

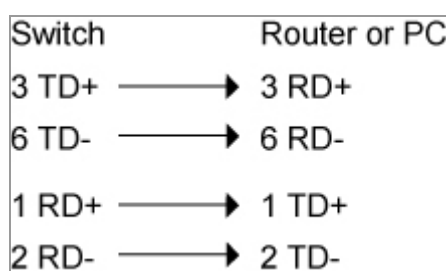


“+” and “-” signs represent the polarity of the wires that make up each wire pair.

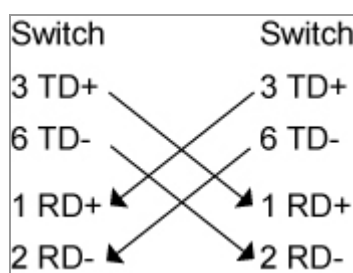
All ports on HUG-828(E) support automatic MDI/MDI-X function, users can use straight-through cables (see figure below) for all network connections to PCs or servers, or to other switches or hubs. When auto MDI/MDI-X is enabled, either type of cable can be used and the interface automatically corrects any incorrect cabling. The table below shows the 10Base-T/100Base-TX MDI and MDI-X port pinouts.

Pin	MDI	MDI-X
1	TD+	RD+
2	TD+	RD-
3	RD+	TD+
6	RD-	TD-

Below are the illustrations of straight through connection and cross over connection.



Straight Through Cable Schematic



Cross Over Cable Schematic

2-4 Gigabit Copper/SFP Combo Ports

HUG-828(E) has 2 copper/SFP combo ports. SFP design gives users more flexibility in choosing fiber modules to fit the existing network structure on the plant floor. The 2 combo ports will automatically detect UTP or fiber connection.



If both copper port and SFP port are cabled, HUG-828(E) has auto-detecting mechanism that will prioritize the fiber connection and disable the copper port connection.

2-5 Installing Your Ethernet Direct Switch

Unpack the HUG-828(E) from the packing box. Please refer to **Package Checklist** section to see if any item is missing or damaged. The installation steps include **Mounting The Switch**, **Wiring The Power Inputs**, **Wiring The Fault Alarm Contact**, and **Cabling**.

2-5.1 Mounting The Switch

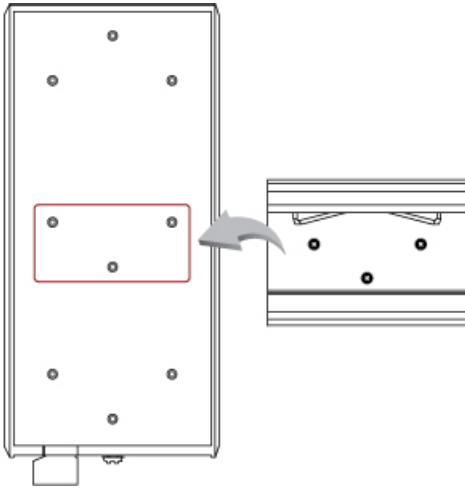
There are two types of mounting options: DIN-Rail mounting, and wall mounting. Users can choose the most suitable mounting installation for your own onsite applications.

2-5.1.1 DIN-Rail Mounting

The DIN-Rail mounting kit is attached to the back panel of HUG-828(E) by default. If not, or users want to disassemble the DIN-Rail mounting kit from the HUG-828(E), follow the steps below.

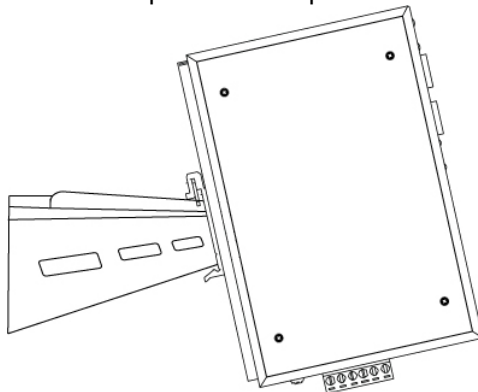
To attach the DIN-Rail mounting kit:

1. Screw the DIN-Rail kit to the position shown in the figure below.
2. To detach DIN-Rail kit from the switch, reverse the step 1.

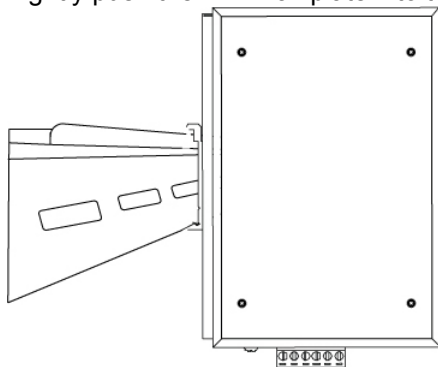


Follow the steps below for mount the switch onto the track.

1. Insert the top of DIN-Rail plate into the track.



2. Lightly push the DIN-Rail plate into the track.

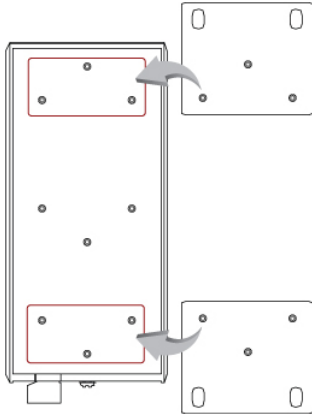


3. Check if the DIN-Rail is tightened on the track or not.
4. To remove the switch from the track, reverse steps above.

2-5.1.2 Wall Mounting

Follow the steps below for wall-mounting installation.

1. Remove the DIN-Rail plate from the switch; loosen the screws to remove the DIN-Rail plate.
2. Place the wall mounting plate on the back panel of the switch.
3. Use the screws to screw the wall mounting plates on the switch.
4. Use the hook holes at the corners of the wall mounting plates to place the switch on the wall.
5. To remove the wall mounting plate, reverse the steps above.



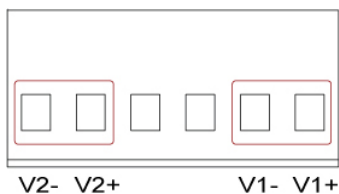
2-5.2 Wiring The Power Inputs

Follow the steps below to wire the power inputs.

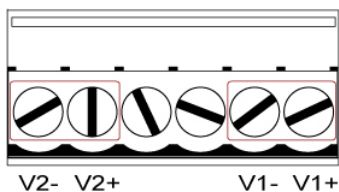


Be sure to disconnect the power cord before installing and/or wiring your switch.
Be sure of the maximum possible current when wiring connections. If the current goes above the maximum ratings, the wire could overheat and result in serious damage to your switch.

1. Insert the positive and negative wires of your DC supply into the corresponding V+ and V- contacts of the terminal block.



2. Tighten the screws to prevent the DC wires from coming detached.

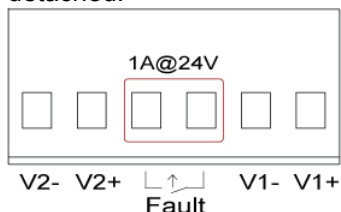


The acceptable wire range is 12 to 24 AWG.
After the wiring the power inputs, the PWR LED will light up. Please refer to LED Indicators section for more information.

2-5.3 Wiring The Fault Alarm Contact

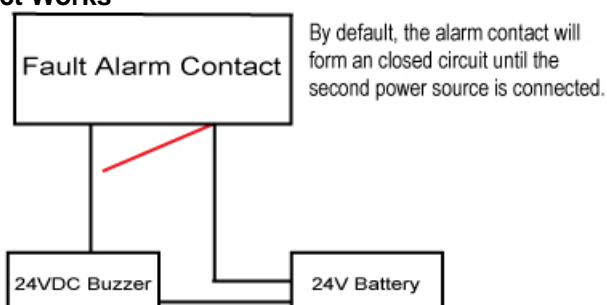
The fault alarm contacts are the two middle terminals located on the terminal block as show in the figure below. It detects errors such as power failure or port break and sends an alarm signal when faults occur. By default, the fault alarm contacts will form an open circuit under normal operation. The contacts will close when power failures or port breaks are detected. See below steps for wiring the fault alarm contact, and the illustration of how fault alarm contact function works.

1. Insert the wires into the two middle terminals. Tighten the screws to prevent the wires from coming detached.



How Fault Alarm Contact Works

When two power sources have been connected, the contact will form an open circuit, as a result, the FAULT LED will be switched off, and the buzzer will be off.



The acceptable wire range is 12 to 24 AWG.

2-5.4 Cabling

For RJ-45 port connection, prepare twisted-paired, straight through Category 5 cables for Ethernet connection. The linking distance between the switch and the network device must be less than 100 meters (328 ft.).

For single-mode fiber connection, a 9/125 μ m single-mode fiber cables must be used. The maximum linking distance can be up to 120km depending on SFP modules.

For multi-mode fiber connection, a 50 or 62.5/125 μ m multi-mode fiber cable must be used. The maximum linking distance can be up to 2km depending on SFP modules.

The UTP port (RJ-45) LED(s) on the switch will light up when the cable is connected with the network device. Please refer to the LED Indicators section for more information.



Before connecting any network device, make sure network devices support auto MDI/MDI-X. If not support, use the cross over Category 5 cables.

After all wiring and connection are done and the LED lights on the switch's front panel show normal status, the hardware installation is complete.

Appendix A

Specifications

HUG-828(E) Product Specifications are as follows:

Hardware		
<i>Interface</i>		
Total Ports	10 ports	
RJ-45 Ports	8 10/100Base-T(X) auto-negotiation speed, full/half duplex mode, auto MDI/MDI-X connection	
Fiber Ports	2 combo ports	
LEDs	Per Unit	Power 1 (Green), Power 2 (Green), Fault (Red)
	Per Port	Link/Activity (Green), Full duplex/Collision (Orange)
Alarm Contact	1A@24VDC	
<i>Power Requirements</i>		
Power Input	12 to 48VDC, redundant power with removable terminal block	
Power Protection	ESD (Ethernet) 6000VDC, Surge 3000VDC, Power Reverse Polarity	
Power Consumption	6.76 watts	
<i>Physical</i>		
Dimensions	IP-30, 72mm (W) x 105mm (D) x 152mm (H)	
Installation	DIN Rail mounting/Wall mounting	
<i>Environmental</i>		
Operating Temp	Regular: -10 to 70°C	
	Extended: -40 to 80°C	
Storage Temp	-40 to 85°C	
Operating Humidity	5% to 90%a RH (non-condensing)	
Technology		
Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) IEEE 802.3ab for 1000BaseT(X) IEEE 802.3z for Gigabit Fiber IEEE 802.3x for Flow Control	
Protocols	CSMA/CD	
Switching Architecture	Store and Forward	
Regulatory Approvals		
EMI	FCC Class A	
EMS	EN61000-4-2, EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-8 EN61000-4-11	

	EN61000-4-12
Safety	UL, cUL, CE/EN60950-1
Shock	IEC60068-2-27
Vibration	IEC60068-2-6
Free Fall	IEC60068-2-32
Class 1 Divison 2	Pending
DNV	Pending
Environmental	WEEE, RoHS
MTBF	295,662 hrs based on Mil-Hdbk-217F, GB
Warranty	5 years

Appendix B

Troubleshooting



Make sure you are using the right power cord/adaptor (12 to 48VDC). Do not use power adapters with DC output higher than 48V. Or it will short circuit the switch.



Select the proper UTP cables to construct your network. Please check that you are using the right cables. Use unshielded twisted-pair (UTP) or shield twisted-pair (STP) cables for RJ-45 connections: 100Ω Category 3, 4 or 5 cables for 10Mbps connections, 100Ω Category 5 cables for 100Mbps, or 100Ω Category 5e/above cables for 1000Mbps connections. Also be sure that the length of any twisted-pair connection does not exceed 100 meters (328 feet).



Diagnostic LED indicators located on the front panel of the switch can help users to easily monitor the switch.



IF the power indicator does not light on when the power cord is plugged in, you may have a problem with power cord. Then check for loose power connections, power losses or surges at power outlet. IF you still cannot resolve the problem, contact your local dealer for assistance.



If the switch LED indicators are normal, the cables are connected correctly, and the packets still cannot transmit, please check your system's Ethernet devices' configuration or status.