



Automation for a Changing World

# Delta Industrial Ethernet

[www.deltaww.com](http://www.deltaww.com)



**DELTA**  
Smarter. Greener. Together.

# Matched to Maximize

## Delta Industrial Ethernet Products and Solutions (IES)

Adapting to the diversity of network communication applications, Delta's IES series industrial Ethernet products and solutions offer an abundant selection with excellent quality in compact and durable designs. From Ethernet switches, IEEE 802.11 wireless communication, mobile wireless communication, serial device servers to protocol gateways, the IES series ensures you precise and stable data transmission among devices. It guarantees a seamless device integration that satisfies critical system applications in industrial environments.



## Ethernet Switches



TAIWAN  
EXCELLENCE  
2014

Tailoring to industrial applications that require highly reliable network systems, Delta's DVS series managed and unmanaged Ethernet switches provide better system performance with functions such as the redundant self-healing ring, high-end layer 2 management, and a wide-operating temperature from -40°C to 75°C. The EMC noise immunity complies with IEC standards and attains a high level 3/4. The intuitive design of the operating interface provides users with easy access and convenience.



## Wireless IEEE 802.11

Delta helps users construct a reliable industrial wireless network by the WLAN products compatible with multiple communication protocols, such as IEEE 802.11 a/n in 5GHz or IEEE 802.11 b/g/n in 2.4GHz. Adopting Multiple-input and Multiple-output (MIMO) technology enables the network bandwidth reach 450Mbps. Delta WLAN products support multiple wireless connectors, including wireless access points, WDS, and clients for easy and economical construction of wireless LANs. The built-in 3-in-1 serial ports directly connect to industrial controllers, saving the effort and cost of cable connection. The built-in gateway for MODBUS, the most common industrial communication protocol, converts MODBUS Serial to MODBUS TCP, seamlessly interconnecting the existing equipment with the Ethernet communication network.



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# Intelligent Transportation System

The Intelligent Transportation System (ITS) integrates advanced electronic, information and sensing technologies for real-time transportation management of pedestrians, roads and traffic. The ITS effectively improves the safety, convenience, and efficiency of transportation, reducing carbon emissions from transportation and its impact on the environment, and supporting economic development.

- ▶ Freeway Traffic Flow Monitoring System
- ▶ CMS Real-Time Traffic Message Display System
- ▶ Tunnel Signal and Alarm Monitoring System
- ▶ Electronic Toll Collection System

## DVS-110W02-3SFP

### 7-port FE + 3-port GbE Combo Managed Ethernet Switch

- ▶ GbE fiber port to enhance backbone transmission
- ▶ STP/RSTP/MSTP for network redundancy to ensure network reliability
- ▶ IP40 metal case, -40°C to 75°C operating temperature



## DVW-W02W2-E2

### IEEE 802.11 a/b/g/n Wireless AP/WDS/Client/Gateway

- ▶ IEEE 802.11n up to 450Mbps data rate
- ▶ Supports 2-port RS-232/422/485 to Ethernet Device Server
- ▶ IP40 metal case, -40°C to 75°C operating temperature



## DVS-G008100A

### 8-port GbE Unmanaged Ethernet Switch

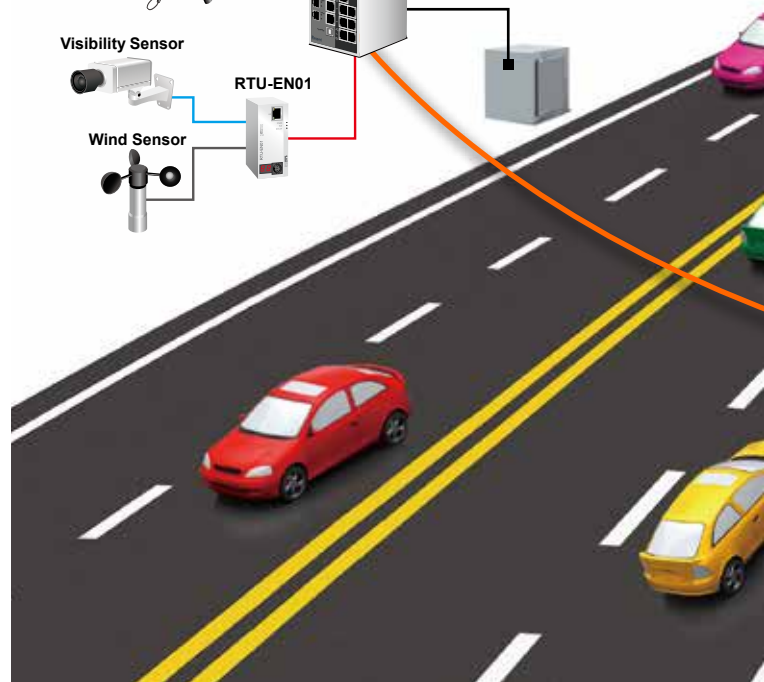
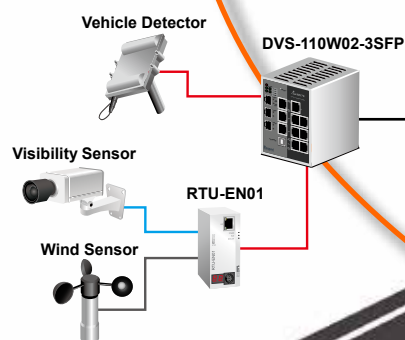
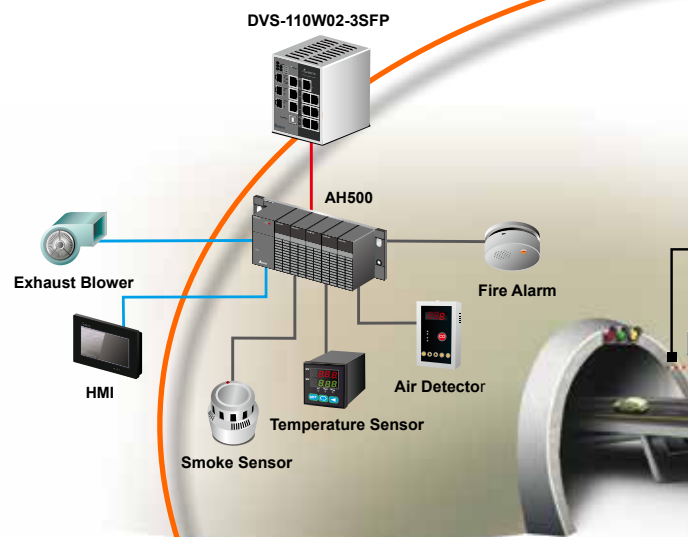
- ▶ Full GbE ports to enhance transmission bandwidth
- ▶ Jumbo frame size up to 9216 Bytes
- ▶ IP40 metal case, -10°C to 60°C operating temperature

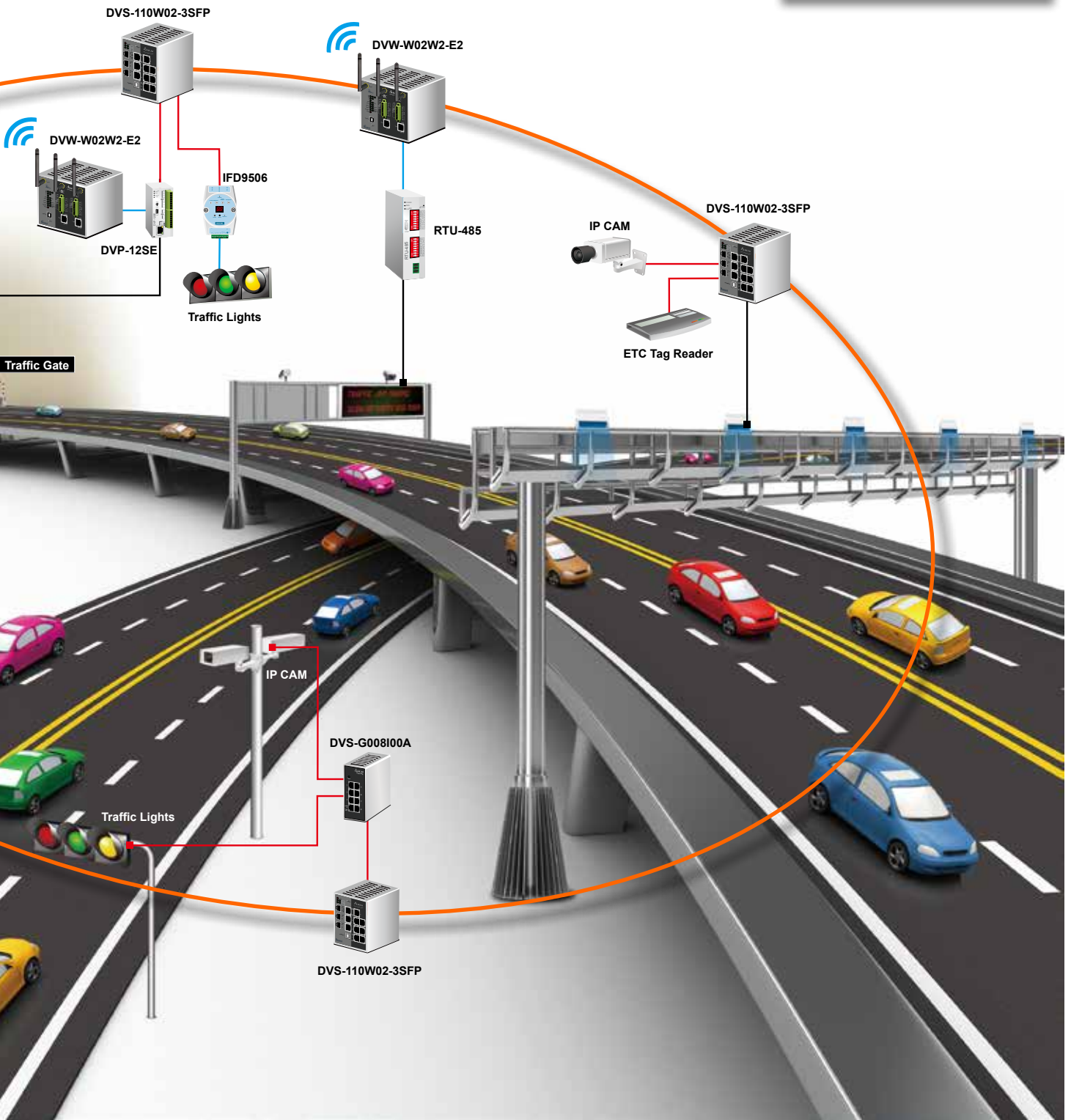
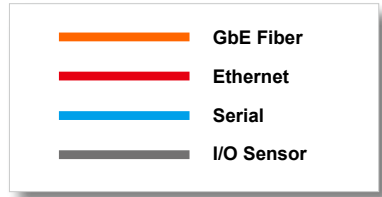


## IFD9506

### Serial-to-Ethernet MODBUS Gateway

- ▶ RS-485 signal isolation protection
- ▶ Supports MODBUS TCP protocol
- ▶ Smart on-line monitoring function





## Wind Power

Wind power has emerged as an alternative energy solution in recent years. Wind power plants are typically located in remote areas, often within a vast territory. The ring network of fiber optic Ethernet is widely adopted for data transmission and management and real-time monitoring of power generation panels. These plant locations can be harsh and hazardous, with a large diurnal temperature variation. System reliability and transmission precision can only be guaranteed with highly noise-immune and durable network devices.

### DVS-110W02-3SFP

#### 7-port FE + 3-port GbE Combo Managed Ethernet Switch

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- ▶ IP40 metal case, -40°C to 75°C operating temperature

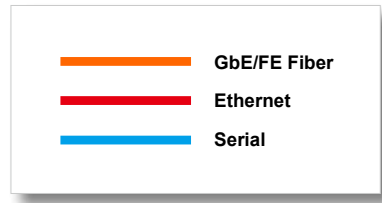


### DVS-016 Series

#### 16-port FE Unmanaged Ethernet Switch

- ▶ Broadcast Storm Protection
- ▶ Auto warning for link-down and power failure by relay output
- ▶ IP40 metal case, -40°C to 75°C operating temperature





# RGV Intelligent Warehouse Carriage Automation System

Wireless signal transmission technology can be applied in various areas. Delta's DVW series matches with Leaky Coaxial Cable (LCX or Radiating Cable) to transform Wi-Fi into stable extension signals which can surround objects, walls, pillars, and transmit signals to every corner of the production line, enhancing Ethernet communication accessibility. They also offer high-speed real-time process capability. When applying the Delta DVW series and LCX to Rail Guided Vehicle (RGV) systems, they can assist factory operators carry materials, which enhances working efficiency and security for maintenance personnel.

- ▶ Industrial wireless warehouse automation and underground communication engineering
- ▶ Wireless radio wave communication systems for rail transport and tunnel engineering
- ▶ Provides automation and wireless communication solutions between floors in the same building

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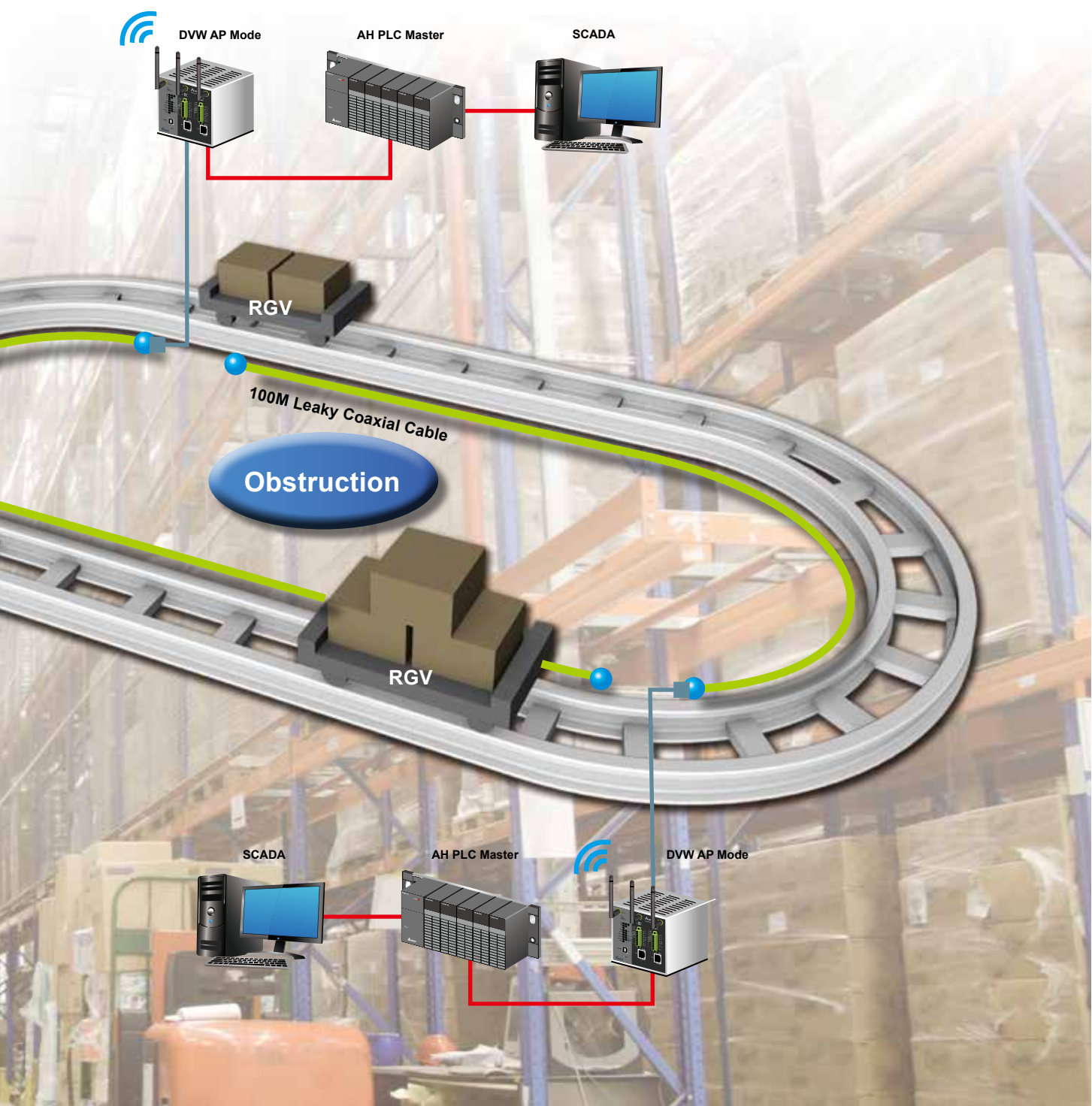
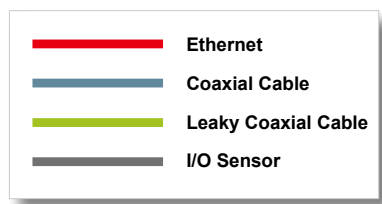
## DVS-016 Series

### 16-port FE Unmanaged Ethernet Switch

- ▶ Utilizes dual-core multi-tasking processor
- ▶ DIO: Max. 4,352 points  
AIO: Max. 544 channels  
RIO: Max. 125,440 digital points / 3,920 analog channels
- ▶ Program capacity: Max. 256k steps
- ▶ Data register: Max. 64k word
- ▶ Excellent program execution speed: 0.3ms / 1k steps
- ▶ CPU built-in with fully isolated RS-232/422/485, Mini-USB, Ethernet, SD Card 1.0 (compatible with the memory cards on the market)







# Ethernet Switches

## Functions

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## Managed Switches

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# Layer 2 Network Management

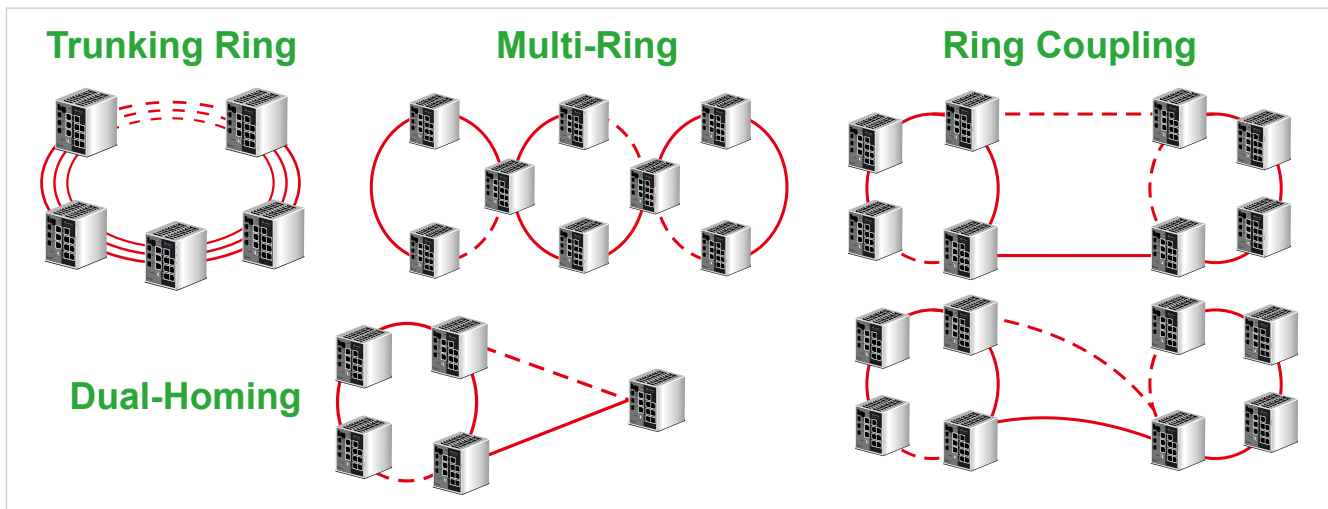
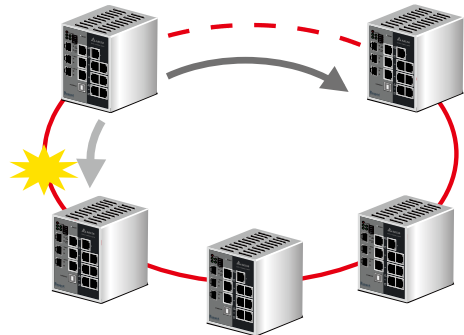
## Network Redundancy Technology

IEEE published the 802.1D Spanning Tree Protocol (STP) in 1998, and in 2004 announced 802.1w Rapid Spanning Tree Protocol (RSTP), which is an enhancement to STP. These network protocols are used to construct backup paths for transmission when a link fails and are applied in network structures with demands for high reliability. In current industrial automation and critical system applications, as the high demand for faster convergence time grows, STP and RSTP's speed, whose unit of convergence time is seconds, becomes insufficient. Delta thoroughly understands customers' needs from different industries. To meet the high demand for speed and reliability, Delta introduced ONE RING and ONE CHAIN ultra-speed redundant protocol to satisfy our customers' needs, which provides faster speed and more functions than STP and RSTP.

### ONE RING

#### Network self-healing brings most recovery

Delta's proprietary self-healing redundant ring technology is called ONE RING. ONE RING can enable redundant paths and provide self-healing recovery time of less than 20 milliseconds to ensure fluent data transmission with minimum loss when any nodes fail or meet default in a ring network. In addition, ONE RING offers customers the selection of Trunking Ring, Multi-Ring, Ring Coupling, and Dual-Homing modes to satisfy their specific needs. With strong ring network functions, ONE RING provides highly flexible and highly reliable network structures, which greatly save on wiring cost.



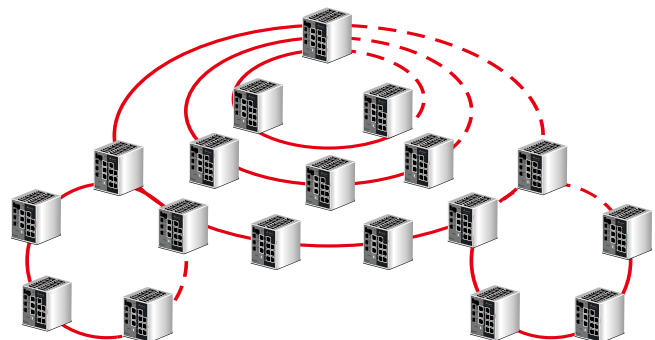
### ONE CHAIN

#### Multi-Network self-healing brings most efficient and trust

Delta's self-healing redundant chain technology is called "ONE CHAIN".

ONE CHAIN is a new generation of Network Redundancy Technology with unlimited expansion functions derived from the design concept of ONE RING.

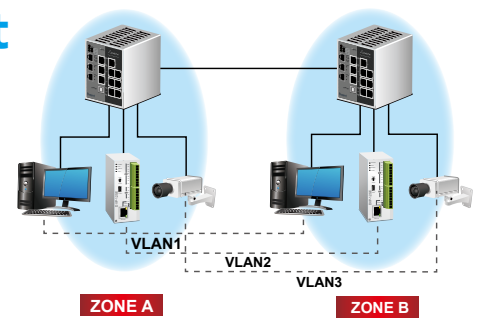
ONE CHAIN is able to offer backup paths within 20 milliseconds when several network nodes fail at the same time to ensure fluent data transmission with minimum loss. Its high speed self-healing time is especially suitable for high-end automation network structures such as a Distributed Control System (DCS). ONE CHAIN is compatible with other existing large Internet backbone network switches, which saves costs for wiring and for changing new switches such as equipment, labor, and time.



# Advanced Network Management

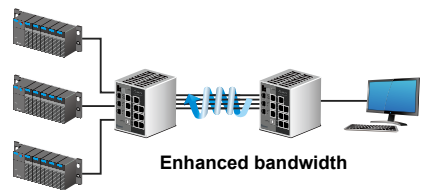
## VLAN

A Virtual Local Area Network (VLAN) is a network topology configured according to a logical scheme rather than a physical layout. VLANs allow users to break up switched environments into multiple broadcast domains, and can be used to combine any collection of LAN segments into an autonomous user group that appears as a single LAN. It enhances performance by conserving bandwidth and improves security by limiting traffic to specific domains. VLANs can be created statically by hand and dynamically through GVRP.



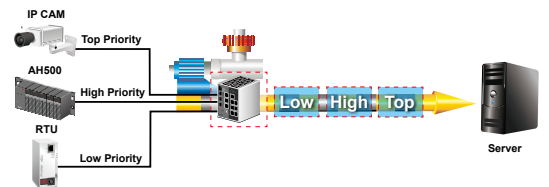
## Trunking

The physical ports of a switch can be aggregated by a logical scheme into a group which forms a physical link. This link serves as a redundant path which enhances bandwidth and improves performance.



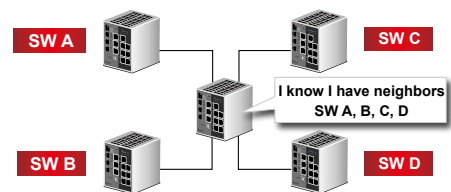
## Quality of Service (QoS)

Network packet prioritization is a process which prioritizes the transmission of packets with a queue. It ensures prompt packet scheduling that is especially effective for delay-sensitive packets and audio or image transmissions with optimal quality of service.



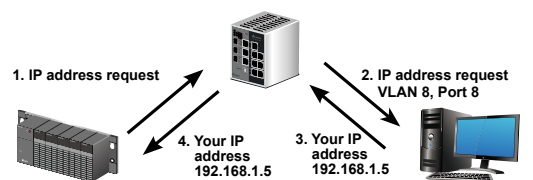
## Link Layer Discovery Protocol (LLDP)

The LLDP protocol is used by network devices for advertising their identity, capabilities, and any updates to neighboring devices on an IEEE 802.1ab network. These messages are stored in SNMP MIB and can be searched through a network management system.



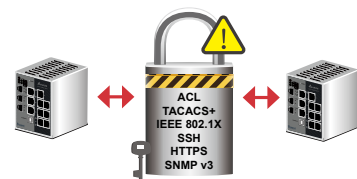
## DHCP Relay Option 82 IP Assignment

DHCP Relay Option 82 delivers additional client information such as ports connected, VLAN, as well as MAC addresses to a DHCP server for more flexible IP addresses assignment.



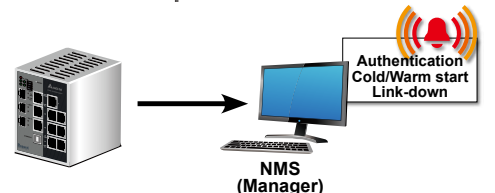
## Enhanced Network Security Management

A complete set of security verification tools further ensures network security for users. Multiple protection mechanisms are incorporated in network management to protect it from unauthorized network access during operation.



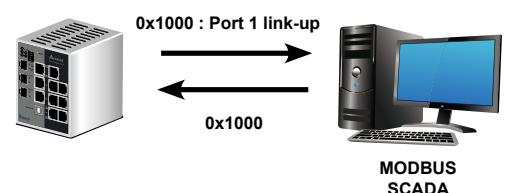
## Simple Network Management Protocol (SNMP)

Delta Managed Ethernet Switches support v1, v2c and v3 versions of SNMP. For users, SNMP Trap messages allow real-time event alarms for authentication failures, cold/warm starts, link-downs, and many more.



## MODBUS TCP Manager

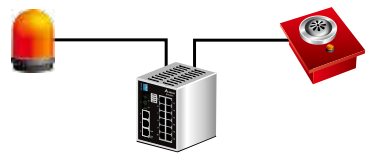
Delta Managed Ethernet Switches support MODBUS TCP protocol for easy integration with an on-site industrial network management system. Users can monitor and manage the operational status via the graphical interface of Supervisory Control and Data Acquisition (SCADA) at any time. The consistency of communication protocols helps users save big on equipment management costs.



# Smart Functions Well-tailored to Your Needs

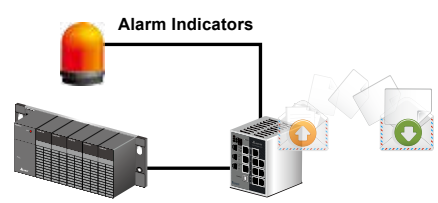
## ▲ Relay Output for Event Alarms

Delta Managed Ethernet Switches have built-in relay output for event alarms. Any occurrence of preset default events and any digital inputs will trigger alarms. With real-time notification, on-site personnel can quickly diagnose and eliminate any incidents.



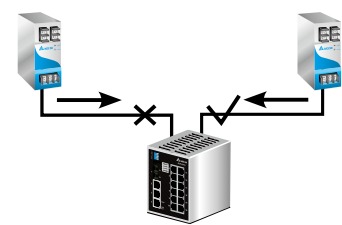
## ▲ Digital Inputs

Designed for industrial environments, the DVS series industrial Ethernet switches easily connect to various industrial devices, such as PLCs or sensors. It delivers real-time alarms to users via relay output or email.



## ▲ Redundant Power Inputs

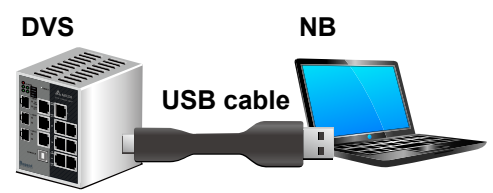
The design of dual power inputs provides excellent integration with the common dual power supply design of critical systems, or with industrial environments. It secures switches from potential power impact and provides highly-reliable and uninterrupted network transmission.



# A Seamless Interconnection

## ▲ USB Console Interface

A simple USB cable is all you need to carry out network management settings.



## ▲ Real-time Web Display

A real-time Web display tells users the connection status of each port with indicators on a Web page. With an uninterrupted network connection, users can manage operations in remote places at any time.



## ▲ SFP DDM

Utilizing the built-in digital diagnostic monitor (DDM) function of the DVS series Industrial Ethernet Switches, users can continuously monitor the current operation status of the Delta SFP fiber transceiver and the transmission quality through a datasheet displayed on the web.



## ▲ Watch Dog Timer

The hardware Watch Dog Timer restores switches from malfunctions caused by any reasons, such as an incorrect network topology or a malicious network attack. It ensures switches work properly in harsh industrial environments.



CPU malfunction = 6 seconds = Auto Reset



# Delta IExplorer Search Tool

IExplorer provides friendly access to search for all IES products on the network. One simple click calls up the Web page for setting software functions.

## DVS-110 series

### Managed Industrial 7-Port FE + 3-Port GbE Combo 100/1000Base-SFP Ethernet Switches



UL508



-40~75°C



EMC LEVEL 4



FANLESS

**Rugged**  
ETHERNET


- ▶ IPv6 address suitable for larger network and neighbor discovery
- ▶ Automatic IP assignment by DHCP/BootP server for easy network construction
- ▶ DHCP relay option 82 for sending DHCP requests with clients' identities to a DHCP server
- ▶ Port-based DHCP server with IP and MAC binding makes IP maintenance much easier\*
- ▶ SNMP v1/v2c/v3 facilitates the exchange of management between network devices
- ▶ Supports EtherNet/IP\* and MODBUS TCP protocols that facilitate the remote management by SCADA and other industrial devices
- ▶ Proprietary ONE RING and ONE CHAIN high end redundancy technologies, easy to build multiple ring topology, self-healing recovery time < 20ms\*
- ▶ STP/RSTP/MSTP for network redundancy further ensures reliability
- ▶ QoS (IEEE 802.1p) and TOS/DSCP for mission-critical applications
- ▶ IEEE 802.1Q VLAN, MAC-based VLAN\*, IP Subnet-based VLAN\*, VLAN isolation\* and GVRP optimize network strategy
- ▶ Enhanced network security with IEEE 802.1X, TACACS+, SSH, HTTPS and SNMP v3
- ▶ IEEE 802.3ad port trunking in parallel to increase the link bandwidth
- ▶ SNTP (simple network time protocol) for network clock synchronization
- ▶ Broadcast/Multicast/Unknown Unicast storm control improves throughput problems
- ▶ Loopback-Detection to avoid broadcast loops, and shutdown the corresponding ports automatically \*
- ▶ Cable diagnostic provides the mechanism to detect and report potential cabling issues\*
- ▶ Intelligent Access Control List (ACL)
- ▶ MAC addresses locking function per port blocks unauthorized access
- ▶ USB console interface for easy connection with laptops
- ▶ IGMP Snooping and GMVP prunes multicast traffic
- ▶ RMON groups 1, 2, 3, 9 (history, statistics, alarms and events) for enhanced flow management and analysis
- ▶ CPU utilization displays the amount of work the CPU handles
- ▶ Port mirroring for Many-to-One ports online troubleshooting
- ▶ Versatile system file updates by TFTP, HTTPS or HTTP
- ▶ DDM diagnosis function by SFP fiber module
- ▶ Auto warning by email, DI, relay, Syslog & SNMP trap
- ▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, EtherCAT, CC-LINK IE and DNP 3.0

\*Please check DELTA website for the latest firmware version

## Specification

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X) and 100Base-FX
- IEEE 802.3ab 1000Base-T
- IEEE 802.3z 1000Base-X
- IEEE 802.3x Flow Control
- IEEE 802.1D Spanning Tree Protocol

- IEEE 802.1w Rapid Spanning Tree Protocol
- IEEE 802.1s Multiple Spanning Tree Protocol
- IEEE 802.1p Class of Service, Priority Protocols
- IEEE 802.1Q VLAN Tagging
- IEEE 802.1X Port Authentication
- IEEE 802.3ad LACP Aggregation
- IEEE 802.1AB Link Layer Discovery Protocol

#### Processing Type

- Store and Forward
- IEEE 802.3x flow control in full duplex, back-pressure flow control in half duplex

## INTERFACE

### Fast Ethernet

#### RJ45 Ports:

- 10/100Base-T(X), auto MDI/MDI-X, auto negotiation

### Gigabit Ethernet Combo Ports

#### RJ45 Ports:

- 10/100/1000Base-T, auto MDI/MDI-X, auto negotiation

#### SFP Ports:

- 100/1000Base-SFP

### Console Port

- USB B-Type connector

### LEDs

#### Device:

- ALARM, PWR1, PWR2, DI1, DI2

#### Ports:

- 100/1000M (SFP port), 10/100/1000M (GbE RJ45 port), 10/100M (FE RJ45 port), LINK/ACT

### Digital Inputs (DI)

- 2 sets
- 0~+5V is OFF
- +11V~30V is ON
- Max. input current 6mA

### Alarm Contacts (DO)

- 2 relay outputs
- Carry current 2A@24VDC

### Reset Button

- 1 set

## PERFORMANCE AND SCALABILITY

### Switching Capacity

- 7.4Gbps, wire-speed, non-blocking switching fabric

### Forwarding Rate

- 11Mpps

### MAC Address Table

- 8K

### Packet Buffer Memory

- 512K bits

### IGMP Multicast Groups

- 256

### Max. VLANs

- 255

### Quality of Service

- 8 priority queues per port

### DHCP/BootP Server

- 1275 IP addresses

### Jumbo Frame

- 9,216 Bytes

## MANAGEMENT

### Software

- STP/RSTP/MSTP, LACP, QoS, IGMP Snooping v1/v2/v3, IGMP Query v1/v2, GARP, GMRP, VLAN, SSH, DNS, HTTP, HTTPS, RADIUS, TACACS+, SNMP v1/v2c/v3, SNMP Traps, TFTP, RMON, LLDP, BootP Server/Client, DHCP Server/Client, DHCP L2 Relay, DHCP Relay Option 82, DHCP Option 66/67, Telnet, Syslog, SMTP, SMTP Server/Client, IPv6, MODBUS TCP, EtherNet/IP

### Security

- MAC/IP/TCP/UDP filtering, HTTPS, SSH, 802.1X, TACACS+, SNMP v3

### Configuration

- Web Browser, Cisco-like Telnet CLI, USB Local Console, SNMP, MODBUS TCP, IExplorer Utility

### MIB

- MIB II, Bridge MIB, SNMP MIB, Ether-like MIB, Q-Bridge/P-Bridge MIB, IF MIB, Traceroute MIB, TCP MIB, UDP MIB, IP MIB, RMON Group 1, 2, 3, 9, Delta Private MIB

## POWER REQUIREMENTS

### Input Voltage

- 2 sets, 12 to 48 VDC redundant terminal block power input

### Input Current

- Max. 0.95A

### Overload Current Protection

- Present, max. input current 3A

### Reverse Polarity Protection

- Present

### Buffer Time

- Min. 12ms at 24VDC

## PHYSICAL

### Housing

- IP40 metal case

### Dimensions

- 145.3 mm (H) x 75 mm (W) x 108.7 mm (D)

### Weight

- 564g

### Installation

- Industrial DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -40°C to 75°C (-40°F to 167°F)

### Storage Temperature

- -40°C to 85°C (-40°F to 185°F)

### Ambient Relative Humidity

- 5% to 95% (non-condensing)

## APPROVALS

### Safety

- UL 508, EN 60950-1, IEC 61131-2

### EMI

- FCC 47 CFR Part 15 Subpart B Class A, IEC 61000-6-4, EN 55022(CISPR22)

### EMS [IEC 61000-6-2, EN 55024(CISPR24)]

- IEC 61000-4-2 level 3, IEC 61000-4-3 level 3, IEC 61000-4-4 level 4, IEC 61000-4-5 level 3, IEC 61000-4-6 level 3, IEC 61000-4-8 level 4, IEC 61000-4-29

### Environmental Type Tests

#### Cold Temperature:

- IEC 60068-2-1

#### Dry Heat:

- IEC 60068-2-2

#### Humidity:

- IEC 60068-2-30

#### Shock:

- IEC 60255-21-2

#### Freefall:

- IEC 60068-2-32

#### Vibration:

- IEC 60068-2-6

#### Hi-Pot:

- 1.5KV

## Ordering Information

Product		Port Combination			Interface		
Model Name	Operating Temperature	Combo Port 10/100/1000Base-T and 100/1000Base-SFP	10/100/1000 Base-T	10/100 Base-T(X)	DI	DO (Relay)	Power Input
DVS-110W02-3SFP	-40°C to 75°C	3	---	7	2	2	2

### Optional Products

LCP Series: 100Base-X/1000Base-X SFP Fiber Transceiver

DVP/CliQ/PMC Series: 12/24 VDC Industrial Power Supply



## DVS-109 series

### Managed Industrial 8-Port FE + 1-Port GbE Ethernet Switches



UL508



-40~75°C



EMC LEVEL 4



FANLESS

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- ▶ Loopback-Detection to avoid broadcast loops, and shutdown the corresponding ports automatically
- ▶ Cable diagnostic provides the mechanism to detect and report potential cabling issues
- ▶ Intelligent Access Control List (ACL)
- ▶ MAC addresses locking function per port blocks unauthorized access
- ▶ USB console interface for easy connection with laptops
- ▶ IGMP Snooping and GMVP prunes multicast traffic
- ▶ RMON groups 1,2,3,9 (history, statistics, alarms and events) for enhanced flow management and analysis
- ▶ CPU utilization displays the amount of work the CPU handles
- ▶ Port mirroring for Many-to-One ports online troubleshooting
- ▶ Versatile system file updates by TFTP, HTTPS or HTTP
- ▶ DDM diagnosis function by SFP fiber module
- ▶ Auto warning by email, DI, relay, Syslog & SNMP trap
- ▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, EtherCAT, CC-LINK IE and DNP 3.0

\*Please check DELTA website for the latest firmware version

## Specification

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X) and 100Base-FX
- IEEE 802.3ab 1000Base-T
- IEEE 802.3x Flow Control
- IEEE 802.1D Spanning Tree Protocol

- IEEE 802.1w Rapid Spanning Tree Protocol
- IEEE 802.1s Multiple Spanning Tree Protocol
- IEEE 802.1p Class of Service, Priority Protocols
- IEEE 802.1Q VLAN Tagging
- IEEE 802.1X Port Authentication
- IEEE 802.3ad LACP Aggregation

- IEEE 802.1AB Link Layer Discovery Protocol

#### Processing Type

- Store and Forward
- IEEE 802.3x Flow control in full duplex, back-pressure flow control in half duplex

## INTERFACE

### Fast Ethernet

#### RJ45 Ports:

- 10/100Base-T(X), auto MDI/MDI-X, auto negotiation

#### Gigabit Ethernet Combo Ports

#### RJ45 Ports:

- 10/100/1000Base-T, auto MDI/MDI-X, auto negotiation

#### SFP Ports:

- 100/1000Base-SFP

#### Console Port

- USB B-Type connector

### LEDs

#### Device:

- ALARM, PWR1, PWR2, DI

#### Ports:

- 10/100/1000M(GbE RJ45 port), 10/100M(FE RJ45 port), LINK/ACT

#### Digital Inputs (DI)

- 1 set
- 0~+5V is OFF
- +11V~30V is ON
- Max. input current 6mA

### Alarm Contacts (DO)

- 1 relay output
- Carry current 2A@24VDC

#### Reset Button

- 1 set

## PERFORMANCE AND SCALABILITY

### Switching Capacity

- 3.6Gbps, Wired speed, Non-blocking switching fabric

### Forwarding Rate

- 5.35Mpps

### MAC Address Table

- 8K

### Packet Buffer Memory

- 512K bits

### IGMP Multicast Groups

- 256

### Max. VLANs

- 255

### Quality of Service

- 8 priority queues per port

### DHCP/BootP Server

- 1275 IP addresses

### Jumbo Frame

- 9,216 Bytes

## MANAGEMENT

### Software

- STP/RSTP/MSTP, LACP, QoS, IGMP Snooping v1/v2/v3, IGMP Query v1/v2, GARP, GMRP, VLAN, SSH, DNS, HTTP, HTTPS, RADIUS, TACACS+, SNMP v1/v2c/v3, SNMP Traps, TFTP, RMON, LLDP, BootP Server/Client, DHCP Server/Client, DHCP L2 Relay, DHCP Relay Option 82, DHCP Option 66/67, Telnet, Syslog, SMTP, SMTP Server/Client, IPv6, MODBUS TCP, EtherNet/IP

### Security

- MAC/IP/TCP/UDP filtering, HTTPS, SSH, 802.1x, TACACS+, SNMP v3

### Configuration

- Web Browser, Cisco-like Telnet CLI, USB Local Console, SNMP, MODBUS TCP, EtherNet/IP, IEXplorer Utility

### MIB

- MIB II, Bridge MIB, SNMP MIB, Ether-like MIB, Q-Bridge/P-Bridge MIB, IF MIB, Traceroute MIB, TCP MIB, UDP MIB, IP MIB, RMON Group 1,2,3,9, Delta Private MIB

## POWER REQUIREMENTS

### Input Voltage

- 2 sets, 12 to 48VDC redundant inputs by terminal block

### Input Current

- Max. 0.58A

### Overload Current Protection

- Present, Max. Input current 3A

### Reverse Polarity Protection

- Present

### Buffer Time

- Min. 12ms at 24VDC

## PHYSICAL

### Housing

- IP40 metal case

### Dimensions

- 145.3 mm (H) x 75 mm (W) x 108.7 mm (D)

### Weight

- 500g

### Installation

- Industrial DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -40°C to 75°C (-40°F to 167°F)

### Storage Temperature

- -40°C to 85°C (-40°F to 185°F)

### Ambient Relative Humidity

- 5% to 95% (non-condensing)

## APPROVALS

### Safety

- UL 508, EN 60950-1, IEC 61131-2

### EMI

- FCC 47 CFR Part 15 Subpart B Class A, IEC 61000-6-4, EN 55022(CISPR22)

### EMS [IEC 61000-6-2, EN 55024(CISPR24)]

- IEC 61000-4-2 level 3, IEC 61000-4-3 level 3, IEC 61000-4-4 level 4, IEC 61000-4-5 level 3, IEC 61000-4-6 level 3, IEC 61000-4-8 level 4, IEC 61000-4-29

### Environmental Type Tests

#### Cold Temperature:

- IEC 60068-2-1

#### Dry Heat:

- IEC 60068-2-2

#### Humidity:

- IEC 60068-2-30

#### Shock:

- IEC 60255-21-2

#### Freefall:

- IEC 60068-2-32

#### Vibration:

- IEC 60068-2-6

#### Hi-Pot:

- 1.5KV

## Ordering Information

Product		Port Combination			Interface		
Model Name	Operating Temperature	Combo Port 10/100/1000Base-T and 100/1000Base-SFP	10/100/1000 Base-T	10/100 Base-T(X)	DI	DO (Relay)	Power Input
DVS-109W02-1GE	-40°C to 75°C	---	1	8	1	1	2

### Optional Products

LCP Series: 100Base-X/1000Base-X SFP Fiber Transceiver

DVP/CliQ/PMC Series: 12/24 VDC Industrial Power Supply

## DVS-108 series

### Managed Industrial 6-Port FE + 2-Port GbE Combo 100/1000Base-SFP Ethernet Switches



UL508



-40~75°C



EMC LEVEL 4



FANLESS

**Rugged**  
ETHERNET


- ▶ IPv6 address suitable for larger network and neighbor discovery
- ▶ Automatic IP assignment by DHCP/BootP server for easy network construction
- ▶ DHCP relay option 82 for sending DHCP requests with clients' identities to a DHCP server
- ▶ Port-based DHCP server with IP and MAC binding makes IP maintenance much easier\*
- ▶ SNMP v1/v2c/v3 facilitates the exchange of management between network devices
- ▶ Supports EtherNet/IP and MODBUS TCP protocols that facilitate the remote management by SCADA and other industrial devices
- ▶ Proprietary ONE RING and ONE CHAIN high end redundancy technologies, easy to build multiple ring topology, self-healing recovery time < 20ms.
- ▶ STP/RSTP/MSTP for network redundancy further ensures reliability
- ▶ QoS (IEEE 802.1p) and TOS/DSCP for mission-critical applications
- ▶ IEEE 802.1Q VLAN, MAC-based VLAN\*, IP Subnet-based VLAN\*, VLAN isolation\* and GVRP optimize network strategy
- ▶ Enhanced network security with IEEE 802.1X, TACACS+, SSH, HTTPS and SNMP v3
- ▶ IEEE 802.3ad port trunking in parallel to increase the link bandwidth
- ▶ SNTP (simple network time protocol) for network clock synchronization
- ▶ Broadcast/Multicast/Unknown Unicast storm control improves throughput problems
- ▶ Loopback-Detection to avoid broadcast loops, and shutdown the corresponding ports automatically.
- ▶ Cable diagnostic provides the mechanism to detect and report potential cabling issues
- ▶ Intelligent Access Control List (ACL)
- ▶ MAC addresses locking function per port blocks unauthorized access
- ▶ USB console interface for easy connection with laptops
- ▶ IGMP Snooping and GMVP prunes multicast traffic
- ▶ RMON groups 1,2,3,9 (history, statistics, alarms and events) for enhanced flow management and analysis
- ▶ CPU utilization displays the amount of work the CPU handles
- ▶ Port mirroring for Many-to-One ports online troubleshooting
- ▶ Versatile system file updates by TFTP, HTTPS or HTTP
- ▶ DDM diagnosis function by SFP fiber module
- ▶ Auto warning by email, DI, relay, Syslog & SNMP trap
- ▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, EtherCAT, CC-LINK IE and DNP 3.0

\*Please check DELTA website for the latest firmware version

## Specification

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X) and 100Base-FX
- IEEE 802.3ab 1000Base-T
- IEEE 802.3z 1000Base-X
- IEEE 802.3x Flow Control
- IEEE 802.1D Spanning Tree Protocol

- IEEE 802.1w Rapid Spanning Tree Protocol
- IEEE 802.1s Multiple Spanning Tree Protocol
- IEEE 802.1p Class of Service, Priority Protocols
- IEEE 802.1Q VLAN Tagging
- IEEE 802.1X Port Authentication
- IEEE 802.3ad LACP Aggregation

- IEEE 802.1AB Link Layer Discovery Protocol

#### Processing Type

- Store and Forward
- IEEE 802.3x Flow control in full duplex, back-pressure flow control in half duplex

## INTERFACE

### Fast Ethernet

#### RJ45 Ports:

- RJ45 Ports: 10/100Base-T(X), auto MDI/MDI-X, auto negotiation

### Gigabit Ethernet Combo Ports

#### RJ45 Ports:

- 10/100/1000Base-T, auto MDI/MDI-X, auto negotiation

#### SFP Ports:

- 100/1000Base-SFP

### Console Port

- USB B-Type connector

### LEDs

#### Device:

- ALARM, PWR1, PWR2, DI1, DI2

#### Ports:

- 100/1000M (SFP port), 10/100/1000M (GbE RJ45 port), 10/100M (FE RJ45 port), LINK/ACT

### Digital Inputs (DI)

- 2 sets
- 0~+5V is OFF
- +11V~30V is ON
- Max. input current 6mA

### Alarm Contacts (DO)

- 2 relay outputs
- Carry current 2A@24VDC

### Reset Button

- 1 set

## PERFORMANCE AND SCALABILITY

### Switching Capacity

- 5.2Gbps, wire-speed, non-blocking switching fabric

### Forwarding Rate

- 7.7Mpps

### MAC Address Table

- 8K

### Packet Buffer Memory

- 512K bits

### IGMP Multicast Groups

- 256

### Max. VLANs

- 255

### Quality of Service

- 8 priority queues per port

### DHCP/BootP Server

- 1275 IP addresses

### Jumbo Frame

- 9,216 Bytes

## MANAGEMENT

### Software

- STP/RSTP/MSTP, LACP, QoS, IGMP Snooping v1/v2/v3, IGMP Query v1/v2, GARP, GMRP, VLAN, SSH, DNS, HTTP, HTTPS, RADIUS, TACACS+, SNMP v1/v2c/v3, SNMP Traps, TFTP, RMON, LLDP, BootP Server/Client, DHCP Server/Client, DHCP L2 Relay, DHCP Relay Option 82, DHCP Option 66/67, Telnet, Syslog, SMTP, SMTP Server/Client, IPv6, MODBUS TCP, EtherNet/IP

### Security

- MAC/IP/TCP/UDP filtering, HTTPS, SSH, 802.1X, TACACS+, SNMP v3

### Configuration

- Web Browser, Cisco-like Telnet CLI, USB Local Console, SNMP, MODBUS TCP, EtherNet/IP, IExplorer Utility

### MIB

- MIB II, Bridge MIB, SNMP MIB, Ether-like MIB, Q-Bridge/P-Bridge MIB, IF MIB, Traceroute MIB, TCP MIB, UDP MIB, IP MIB, RMON Group 1,2,3,9, Delta Private MIB

## POWER REQUIREMENTS

### Input Voltage

- 2 sets, 12 to 48 VDC redundant terminal block power input

### Input Current

- Max. 0.87A

### Overload Current Protection

- Present, max. input current 3A

### Reverse Polarity Protection

- Present

### Buffer Time

- Min. 12ms at 24VDC

## PHYSICAL

### Housing

- IP40 metal case

### Dimensions

- 145.3 mm (H) x 75 mm (W) x 108.7 mm (D)

### Weight

- 520g

### Installation

- Industrial DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -40°C to 75°C (-40°F to 167°F)

### Storage Temperature

- -40°C to 85°C (-40°F to 185°F)

### Ambient Relative Humidity

- 5% to 95% (non-condensing)

## APPROVALS

### Safety

- UL 508, EN 60950-1, IEC 61131-2

### EMI

- FCC 47 CFR Part 15 Subpart B Class A, IEC 61000-6-4, EN 55022(CISPR22)

### EMS [IEC 61000-6-2, EN 55024(CISPR24)]

- IEC 61000-4-2 level 3, IEC 61000-4-3 level 3, IEC 61000-4-4 level 4, IEC 61000-4-5 level 3, IEC 61000-4-6 level 3, IEC 61000-4-8 level 4, IEC 61000-4-29

### Environmental Type Tests

#### Cold Temperature:

- IEC 60068-2-1

#### Dry Heat:

- IEC 60068-2-2

#### Humidity:

- IEC 60068-2-30

#### Shock:

- IEC 60255-21-2

#### Freefall:

- IEC 60068-2-32

#### Vibration:

- IEC 60068-2-6

#### Hi-Pot:

- 1.5KV

## Ordering Information

Product		Port Combination			Interface		
Model Name	Operating Temperature	Combo Port 10/100/1000Base-T and 100/1000Base-SFP	10/100/1000 Base-T	10/100 Base-T(X)	DI	DO (Relay)	Power Input
DVS-108W02-2SFP	-40°C to 75°C	2	---	6	2	2	2

### Optional Products

LCP Series: 100Base-X/1000Base-X SFP Fiber Transceiver

DVP/CliQ/PMC Series: 12/24 VDC Industrial Power Supply

# DVS-G008I/G005I00A Series

## Unmanaged Industrial 5 and 8-Port GbE Ethernet Switches



UL508



EMC LEVEL 3



FANLESS

- ▶ Supports IEEE 802.1p based QoS for packet forwarding precedence
- ▶ Built-in Broadcast Storm Protection
- ▶ Transparent transmission of VLAN tagged packets
- ▶ Jumbo frame size up to 9216 Bytes
- ▶ EEE Green Ethernet for power savings
- ▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, EtherCAT, CC-LINK IE and DNP 3.0

## Specification

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X) and 100Base-FX
- IEEE 802.3ab 1000Base-T
- IEEE 802.3x Flow Control
- IEEE 802.1p Class of Service, Priority Protocols

#### Processing Type

- Store and Forward
- IEEE 802.3x flow control in full duplex, back-pressure flow control in half duplex

### INTERFACE

#### Gigabit Ethernet

##### RJ45 Ports:

- 10/100/1000Base-T, auto MDI/MDI-X, auto negotiation

#### LEDs

##### Per Device:

- PWR

##### Per Port:

- 10/100/1000M, LINK/ACT

### PERFORMANCE AND SCALABILITY

#### Switching Capacity

##### DVS-G005I00A:

- 10Gbps, wire-speed, non-blocking switching fabric

##### DVS-G008I00A:

- 16Gbps, wire-speed, non-blocking switching fabric

#### Forwarding Rate

##### DVS-G005I00A:

- 7.44Mpps

##### DVS-G008I00A:

- 11.9Mpps

#### MAC Address Table

##### DVS-G005I00A:

- 2K

##### DVS-G008I00A:

- 8K

#### Packet Buffer Memory

##### DVS-G005I00A:

- 1M bits

##### DVS-G008I00A:

- 2M bits

#### Jumbo Frame

- 9,216 Bytes

#### Broadcast Storm Protection

- Default enabled

#### Transparent Forwarding VLAN Tagged Packets

- Default enabled

#### IEEE 802.1p based QoS

- Default enabled

#### Green Ethernet

- Default enabled

## POWER REQUIREMENTS

### Input Voltage

- 1 set, 12 to 48 VDC terminal block input

### Input Current

- Max. 0.18A

### Overload Current Protection

- Present, max. input current 3A

### Reverse Polarity Protection

- Present

### Buffer Time

- Min. 13ms at 24VDC

## PHYSICAL

### Housing

- IP40 metal case

### Dimensions

- 145.3mm (H) x 45mm (W) x 108.7mm (D)

### Weight

- 300g

### Installation

- Industrial DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -10°C to 60°C (14°F to 140°F)

### Storage Temperature

- -40°C to 85°C (-40 °F to 185 °F )

### Ambient Relative Humidity

- 5% to 95% (non-condensing)

## APPROVALS

### Safety

- UL 508, EN 60950-1, IEC 61131-2

### EMI

- FCC 47 CFR Part 15 Subpart B Class A, IEC 61000-6-4, EN 55022(CISPR22)

### EMS [IEC 61000-6-2, EN 55024(CISPR24)]

- IEC 61000-4-2 level 3, IEC 61000-4-3 level 3, IEC 61000-4-4 level 4, IEC 61000-4-5 level 2, IEC 61000-4-6 level 2, IEC 61000-4-8 level 4, IEC 61000-4-29

### Environmental Type Tests

#### Cold Temperature:

- IEC 60068-2-1

#### Dry Heat:

- IEC 60068-2-2

#### Humidity:

- IEC 60068-2-30

#### Shock:

- IEC 60255-21-2

### Freefall:

- IEC 60068-2-32

### Vibration:

- IEC 60068-2-6

### Hi-Pot:

- 1.5KV

## Ordering Information

Product		Port Combination			Interface		
Model Name	Operating Temperature	Combo Port 10/100/1000Base-T and 100/1000Base-SFP	10/100/1000 Base-T	10/100 Base-T(X)	DI	DO (Relay)	Power Input
DVS-G008I00A	-10°C to 60°C	---	8	---	---	---	1
DVS-G005I00A	-10°C to 60°C	---	5	---	---	---	1

### Optional Products

DVP/CliQ/PMC Series: 12/24 VDC Industrial Power Supply



# DVS-016 Series

## Unmanaged Industrial 16-Port FE Ethernet Switches



- ▶ Supports IEEE 802.1p based QoS for packet forwarding precedence
- ▶ Built-in Broadcast Storm Protection
- ▶ Transparent transmission of VLAN tagged packets
- ▶ 12 to 48 VDC redundant terminal block power input
- ▶ Auto warning by relay output for link-down and power failure
- ▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, EtherCAT, CC-LINK IE and DNP 3.0

## Specification

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X) and 100Base-FX
- IEEE 802.3x Flow Control
- IEEE 802.1p Class of Service, Priority Protocols

#### Processing Type

- Store and Forward
- IEEE 802.3x flow control in full duplex, back-pressure flow control in half duplex

### INTERFACE

#### Fast Ethernet

##### RJ45 Ports:

- 10/100Base-T(X), auto MDI/MDI-X, auto negotiation

##### Fiber Optic Ports:

- 100Base-FX (SC connector), MultiMode or SingleMode

#### LEDs

##### Per Device:

- ALARM, PWR1, PWR2

##### Per Port:

- 100M (RJ45 port), 100M (fiber port), LINK/ACT

#### DIP Switches

- Port link-down alarm configuration

#### Alarm Contacts (DO)

- 1 relay output
- Carry current 2A@24VDC

### PERFORMANCE AND SCALABILITY

#### Switching Capacity

- 3.2Gbps, wire-speed, non-blocking switching fabric

#### Forwarding Rate

- 4.8Mpps

#### MAC Address Table

- 8K

#### Packet Buffer Memory

- 1M bits

#### Broadcast Storm Protection

- Default enabled

#### Transparent Forwarding VLAN Tagged Packets

- Default enabled

#### IEEE 802.1p based QoS

- Default enabled

### POWER REQUIREMENTS

#### Input Voltage

- 2 sets, 12 to 48 VDC redundant terminal block input

#### Input Current

- Max. 0.6A

#### Overload Current Protection

- Present, max. input current 3A

#### Reverse Polarity Protection

- Present

#### Buffer Time

- Min. 13ms at 24VDC

### PHYSICAL

#### Housing

- IP40 metal case

#### Dimensions

- 145.3mm (H) x 75mm (W) x 108.7mm (D)

#### Weight

- 490g

#### Installation

- Industrial DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -40°C to 75°C (-40°F to 167°F)

### Storage Temperature

- 40°C to 85°C (-40°F to 185°F)

### Ambient Relative Humidity

- 5% to 95% (non-condensing)

## APPROVALS

### Safety

- UL 508, EN 60950-1, IEC 61131-2

### EMI

- FCC 47 CFR Part 15 Subpart B Class B, IEC 61000-6-4, EN 55022(CISPR22)

### EMS [IEC 61000-6-2, EN 55024(CISPR24)]

- IEC 61000-4-2 level 3, IEC 61000-4-3 level 3, IEC 61000-4-4 level 4, IEC 61000-4-5 level 3, IEC 61000-4-6 level 3, IEC 61000-4-8 level 4, IEC 61000-4-29

### Environmental Type Tests

#### Cold Temperature:

- IEC 60068-2-1

#### Dry Heat:

- IEC 60068-2-2

#### Humidity:

- IEC 60068-2-30

#### Shock:

- IEC 60255-21-2

#### Freefall:

- IEC 60068-2-32

#### Vibration:

- IEC 60068-2-6

#### Hi-Pot:

- 1.5KV

## Fiber Optics

	100Base-FX	
	MultiMode	SingleMode
Cable	62.5/125µm, 50/125µm	9/125µm
Wavelength	1310nm	1310nm
Max. TX Power	-14dBm	-8dBm
Min. TX Power	-20dBm(1) -22.5dBm(2)	-15dBm
RX Sensitivity	-31dBm	-31dBm
Optical Budget	11dBm(1) 8.5dBm(2)	16dBm
Max. Link Distance	5km	30km

(1) 62.5/125µm fiber optic cable (2) 50/125µm fiber optic cable

**Note:** The actual link distance of a particular fiber optic link depends on the optical budget, the number of connectors and splices, and cabling quantity. Please measure and verify the actual link loss values once the link is established to identify any potential performance issues.

## Ordering Information

Product		Port Combination			Interface		
Model Name	Operating Temperature	10/100 Base-T(X)	100Base-FX		DI	DO (Relay)	Power Input
			SC Connector, MultiMode, 5km	SC Connector, SingleMode, 30km			
DVS-016W01	-40°C to 75°C	16	---	---	---	1	2
DVS-016W01-MC01	-40°C to 75°C	15	1	---	---	1	2
DVS-016W01-SC01	-40°C to 75°C	15	---	1	---	1	2

### Optional Products

DVP/CliQ/PMC Series: 12/24 VDC Industrial Power Supply

# DVS-008 Series

## Unmanaged Industrial 8-Port FE Ethernet Switches



- ▶ Supports IEEE 802.1p based QoS for packet forwarding precedence
- ▶ Built-in Broadcast Storm Protection
- ▶ Transparent transmission of VLAN tagged packets
- ▶ 12 to 48 VDC redundant terminal block power input
- ▶ Auto warning by relay output for link-down and power failure
- ▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, EtherCAT, CC-LINK IE and DNP 3.0

## Specification

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X) and 100Base-FX

- IEEE 802.3x Flow Control
- IEEE 802.1p Class of Service, Priority Protocols

#### Processing Type

- Store and Forward
- IEEE 802.3x flow control in full duplex, back-pressure flow control in half duplex

### INTERFACE

#### Fast Ethernet

##### RJ45 Ports:

- 10/100Base-T(X), auto MDI/MDI-X, auto negotiation

##### Fiber Optic Ports:

- 100Base-FX(SC connector), MultiMode or SingleMode

#### LEDs

##### Per Device:

- ALARM, PWR1, PWR2

##### Per Port:

- 100M(RJ45 port), 100M(fiber port), LINK/ACT

#### DIP Switches

- Port link-down alarm configuration

#### Alarm Contacts (DO)

- 1 relay output
- Carry current 2A@24VDC

### PERFORMANCE AND SCALABILITY

#### Switching Capacity

- 1.6Gbps, wire-speed, non-blocking switching fabric

#### Forwarding Rate

- 2.4Mpps

#### MAC Address Table

- 8K

#### Packet Buffer Memory

- 1M bits

#### Broadcast Storm Protection

- Default enabled (DVS-008W series)

#### Transparent Forwarding VLAN Tagged Packets

- Default enabled (DVS-008W series)

#### IEEE 802.1p based QoS

- Default enabled (DVS-008W series)

### POWER REQUIREMENTS

#### Input Voltage

##### DVS-008W series:

- 2 sets, 12 to 48 VDC redundant terminal block input

##### DVS-008I00:

- 1 set, 12 to 48 VDC terminal block input

#### Input Current

##### DVS-008W series:

- Max. 0.45A

##### DVS-008I00:

- Max. 0.18A

#### Overload Current Protection

- Present, max. input current 3A

#### Reverse Polarity Protection

- Present

#### Buffer Time

##### DVS-008W series:

- Min. 13ms at 24VDC

##### DVS-008I:

- Min. 10ms at 24VDC

## PHYSICAL

### Housing

- IP40 metal case

### Dimensions

#### DVS-008W series:

- 145.3mm (H) x 75mm (W) x 108.7mm (D)

#### DVS-008100:

- 145.3mm (H) x 45mm (W) x 108.7mm (D)

### Weight

#### DVS-008W series:

- 430g

#### DVS-008100:

- 300g

### Installation

- Industrial DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

#### DVS-008W series:

- -40°C to 75°C (-40°F to 167°F)

#### DVS-008100:

- -10°C to 60°C (14°F to 140°F)

- Tested @ -25°C to 70°C (-13°F to 158°F)

### Storage Temperature

- -40°C to 85°C (-40°F to 185°F)

### Ambient Relative Humidity

- 5% to 95% (non-condensing)

## APPROVALS

### Safety

- UL 508, EN 60950-1, IEC 61131-2

### EMI

- FCC 47 CFR Part 15 Subpart B Class B, IEC 61000-6-4, EN 55022(CISPR22),

### EMS [IEC 61000-6-2, EN 55024(CISPR24)]

- IEC 61000-4-2 level 3, IEC 61000-4-3 level 3, IEC 61000-4-4 level 4, IEC 61000-4-5 level 3, IEC 61000-4-6 level 3, IEC 61000-4-8 level 4, IEC 61000-4-29

### Environmental Type Tests

#### Cold Temperature:

- IEC 60068-2-1

#### Dry Heat:

- IEC 60068-2-2

#### Humidity:

- IEC 60068-2-30

### Shock:

- IEC 60255-21-2

### Freefall:

- IEC 60068-2-32

### Vibration:

- IEC 60068-2-6

### Hi-Pot:

- 1.5KV

## Fiber optics

	100Base-FX	
	MultiMode	SingleMode
Cable	62.5/125µm, 50/125µm	9/125µm
Wavelength	1310nm	1310nm
Max. TX Power	-14dBm	-8dBm
Min. TX Power	-20dBm(1) -22.5dBm(2)	-15dBm
RX Sensitivity	-31dBm	-31dBm
Optical Budget	11dBm(1) 8.5dBm(2)	16dBm
Max. Link Distance	5km	30km

(1) 62.5/125µm fiber optic cable (2) 50/125µm fiber optic cable

**Note:** The actual link distance of a particular fiber optic link depends on the optical budget, the number of connectors and splices, and cabling quantity. Please measure and verify the actual link loss values once the link is established to identify any potential performance issues.

## Ordering Information

Product		Port Combination			Interface		
Model Name	Operating Temperature	10/100 Base-T(X)	100Base-FX		DI	DO (Relay)	Power Input
			SC Connector, MultiMode, 5km	SC Connector, SingleMode, 30km			
DVS-008100	-10°C to 60°C	8	---	---	---	---	1
DVS-008W01	-40°C to 75°C	8	---	---	---	1	2
DVS-008W01-MC01	-40°C to 75°C	7	1	---	---	1	2
DVS-008W01-MC02	-40°C to 75°C	6	2	---	---	1	2
DVS-008W01-SC01	-40°C to 75°C	7	---	1	---	1	2
DVS-008W01-SC02	-40°C to 75°C	6	---	2	---	1	2

### Optional Products

DVP/CliQ/PMC Series: 12/24 VDC Industrial Power Supply

# DVS-005 Series

## Unmanaged Industrial 5-Port FE Ethernet Switches



- ▶ 12 to 48 VDC redundant terminal block power input
- ▶ Auto warning by relay output for link-down and power failure
- ▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, EtherCAT, CC-LINK IE, and DNP 3.0

## Specification

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X) and 100Base-FX
- IEEE 802.3x Flow Control

#### Processing Type

- Store and forward
- IEEE 802.3x flow control in full duplex, back-pressure flow control in half duplex

### INTERFACE

#### Fast Ethernet

##### RJ45 Ports:

- 10/100Base-T(X), auto MDI/MDI-X, auto negotiation

##### Fiber Optic Ports:

- 100Base-FX (SC connector), MultiMode or SingleMode

#### LEDs

##### Per Device:

- ALARM, PWR1, PWR2

##### Per Port:

- 100M (RJ45 port), 100M (fiber port), LINK/ACT

#### DIP Switches

Port link-down alarm configuration

#### Alarm Contacts (DO)

- 1 relay output
- Carry current 2A@24VDC

### PERFORMANCE AND SCALABILITY

#### Switching Capacity

- 1Gbps, wire-speed, non-blocking switching fabric

#### Forwarding Rate

- 1.5Mpps

#### MAC Address Table

- 1K

#### Packet Buffer Memory

- 512K bits

### POWER REQUIREMENTS

#### Input Voltage

##### DVS-005W series:

- 2 sets, 12 to 48 VDC redundant terminal block power input

##### DVS-005100:

- 1 set, 12 to 48 VDC terminal block input

#### Input Current

- Max. 0.24A

#### Overload Current Protection

- Present, max. input current 3A

#### Reverse Polarity Protection

- Present

#### Buffer Time

- Min. 13ms at 24VDC

### PHYSICAL

#### Housing

- IP40 metal case

#### Dimensions

- 145.3mm (H) x 45mm (W) x 108.7mm (D)

#### Weight

- 300g

#### Installation

- Industrial DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

#### DVS-005W series:

- -40°C to 75°C (-40°F to 167°F)

#### DVS-005I00:

- -10°C to 60°C (14°F to 140°F)
- Tested @ -25°C to 70°C (-13°F to 158°F)

### Storage Temperature

- -40°C to 85°C (-40°F to 185°F)

### Ambient Relative Humidity

- 5% to 95% (non-condensing)

## APPROVALS

### Safety

- UL 508, EN 60950-1, IEC 61131-2

### EMI

- FCC 47 CFR Part 15 Subpart B Class B, IEC 61000-6-4, EN 55022(CISPR22),

### EMS [IEC 61000-6-2, EN 55024(CISPR24)]

- IEC 61000-4-2 level 3, IEC 61000-4-3 level 3, IEC 61000-4-4 level 4, IEC 61000-4-5 level 3, IEC 61000-4-6 level 3, IEC 61000-4-8 level 4, IEC 61000-4-29

### Environmental Type Tests

#### Cold Temperature:

- IEC 60068-2-1

#### Dry Heat:

- IEC 60068-2-2

### Humidity:

- IEC 60068-2-30

### Shock:

- IEC 60255-21-2

### Freefall:

- IEC 60068-2-32

### Vibration:

- IEC 60068-2-6

### Hi-Pot:

- 1.5KV

## Fiber optics

	100Base-FX	
	MultiMode	SingleMode
Cable	62.5/125µm, 50/125µm	9/125µm
Wavelength	1310nm	1310nm
Max. TX Power	-14dBm	-8dBm
Min. TX Power	-20dBm(1) -22.5dBm(2)	-15dBm
RX Sensitivity	-31dBm	-31dBm
Optical Budget	11dBm(1) 8.5dBm(2)	16dBm
Max. Link Distance	5km	30km

(1) 62.5/125µm fiber optic cable (2) 50/125µm fiber optic cable

**Note:** The actual link distance of a particular fiber optic link depends on the optical budget, the number of connectors and splices, and cabling quantity. Please measure and verify the actual link loss values once the link is established to identify any potential performance issues.

## Ordering Information

Product		Port Combination			Interface		
Model Name	Operating Temperature	10/100 Base-T(X)	100Base-FX		DI	DO (Relay)	Power Input
			SC Connector, MultiMode, 5km	SC Connector, SingleMode, 30km			
DVS-005I00	-10°C to 60°C	5	---	---	---	---	1
DVS-005W01	-40°C to 75°C	5	---	---	---	1	2
DVS-005W01-MC01	-40°C to 75°C	4	1	---	---	1	2
DVS-005W01-SC01	-40°C to 75°C	4	---	1	---	1	2

### Optional Products

DVP/CliQ/PMC Series: 12/24 VDC Industrial Power Supply

# LCP-GbE Series

## 1-Port Gigabit Ethernet SFP Fiber Transceiver

- ▶ Compliant with IEEE 802.3z
- ▶ Full duplex operation
- ▶ Supports IEEE 802.3x flow control
- ▶ DDM diagnosis function enhances transmission quality
- ▶ Duplex LC connector interface
- ▶ Hot-Pluggable for maximum flexibility
- ▶ TTL signal detection indicator
- ▶ Class 1 laser product (Compliant with IEC 60825-1 and IEC 60825-2)
- ▶ Metal case for better EMI immunity
- ▶ Wide operating temperature



## Specification

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.3z 1000Base-X

### INTERFACE

#### Gigabit Ethernet

- Port number: 1
- Connectors: Duplex LC

### Digital Diagnostics Monitoring Function (DDM)

#### Basic Information

- Ethernet Compliance Code, Vendor Name, Wavelength, Distance

#### Enhanced Parameters

- Temperature, Supply Voltage, Transmitted Bias Current, Transmitted Power, Received Power

**Note1:** All Enhanced Parameters listed above include alarm and warning thresholds

**Note2:** DDM function is fully compatible with Delta DVS series Industrial Ethernet Switches

### Fiber Optics

	1000Base-X		
	LCP-1250A4FDR	LCP-1250B4QDR	LCP-1250B4MDR
Cable	50/125µm MultiMode	9/125µm SingleMode	9/125µm SingleMode
Wavelength	850nm	1310nm	1310nm
Max. TX Power	-4dBm	-3dBm	1dBm
Min. TX Power	-9.5dBm	-9.5dBm	-4dBm
RX Sensitivity	-17dBm	-20dBm	-23dBm
Optical Budget	7.5dBm	10.5dBm	19dBm

## PHYSICAL

### Housing

- Metal case

### Dimensions

- 8.5mm (H) x 13.4mm (W) x 57mm (D)

### Installation

- Hot-swappable, pluggable

## ENVIRONMENTAL LIMITS

### Operating Temperature

#### Standard Models:

- -5°C to 70°C (23°F to 158°F)

#### Wide Temp. Models:

- -40°C to 85°C (-40°F to 185°F)

### Storage Temperature

- -40°C to 85°C (-40°F to 185°F)

### Ambient Relative Humidity

- 5% to 95% (non-condensing)

## APPROVALS

### Safety

- UL 60950-1, EN 60950-1

### Laser Eye Safety

- IEC 60825-1, EN 60825

### EMI

- FCC 47 CFR Part 15 Subpart B Class B, EN 55022, CISPR 22

### ESD

- IEC 61000-4-2, MIL-STD-883E, EIA-JESD22-A115-A

## Ordering Information

Product		Interface		
Standard Temperature -5°C to 70°C	Wide Temperature -40°C to 85°C	Connectors	Fiber Type	Max. Link Distance
LCP-1250A4FDRJ	LCP-1250A4FDRTJ	Duplex LC	MultiMode	550m
LCP-1250B4QDRJ	LCP-1250B4QDRTJ	Duplex LC	SingleMode	10km
LCP-1250B4MDRJ	LCP-1250B4MDRTJ	Duplex LC	SingleMode	40km

**Note:** The actual link distance of a particular fiber optic link depends on the optical budget, the number of connectors and splices, and cabling quantity. Please measure and verify the actual link loss values once the link is established to identify any potential performance issues.



# LCP-1FE Series

## 1-Port Fast Ethernet SFP Fiber Transceiver

- ▶ Compliant with IEEE 802.3u
- ▶ Full duplex operation
- ▶ Supports IEEE 802.3x flow control
- ▶ DDM diagnosis function enhances transmission quality
- ▶ Duplex LC connector interface
- ▶ Hot-Pluggable for maximum flexibility
- ▶ TTL signal detection indicator
- ▶ Class 1 laser product (Compliant with IEC 60825-1 and IEC 60825-2)
- ▶ Metal case for better EMI immunity
- ▶ Wide operating temperature



## Specification

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.3u 100Base-FX

### INTERFACE

#### Fast Ethernet

- Port number: 1
- Connectors: Duplex LC

### Digital Diagnostics Monitoring Function (DDM )

#### Basic Information

- Ethernet Compliance Code, Vendor Name, Wavelength, Distance

#### Enhanced Parameters

- Temperature, Supply Voltage, Transmitted Bias Current, Transmitted Power, Received Power

**Note1:** All Enhanced Parameters listed above include alarm and warning thresholds

**Note2:** DDM function is fully compatible with Delta DVS series Industrial Ethernet Switches

### Fiber Optics

	100Base-FX		
	LCP-155A4HDR	LCP-155B4JDR	LCP-155B4MDR
Cable	62.5/125 $\mu$ m MultiMode	9/125 $\mu$ m SingleMode	9/125 $\mu$ m SingleMode
Wavelength	1310nm	1310nm	1310nm
Max. TX Power	-14dBm	-8dBm	0dBm
Min. TX Power	-20dBm	-15dBm	-5dBm
RX Sensitivity	-31dBm	-31dBm	-34dBm
Optical Budget	11dBm	16dBm	29dBm

## PHYSICAL

### Housing

- Metal case

### Dimensions

- 8.5mm (H) x 13.4mm (W) x 57mm (D)

### Installation

- Hot-swappable, pluggable

## ENVIRONMENTAL LIMITS

### Operating Temperature

#### Standard Models:

- -5°C to 70°C (23°F to 158°F)

#### Wide Temp. Models:

- -40°C to 85°C (-40°F to 185°F)

### Storage Temperature

- -40°C to 85°C (-40°F to 185°F)

### Ambient Relative Humidity

- 5% to 95% (non-condensing)

## APPROVALS

### Safety

- UL 60950-1, EN 60950-1

### Laser Eye Safety

- IEC 60825-1, EN 60825

### EMI

- FCC 47 CFR Part 15 Subpart B Class B, EN 55022, CISPR 22

### ESD

- IEC 61000-4-2, MIL-STD-883E, EIA-JESD22-A115-A

## Ordering Information

Product		Interface		
Standard Temperature -5°C to 70°C	Wide Temperature -40°C to 85°C	Connectors	Fiber Type	Max. Link Distance
LCP-155A4HDRJ	LCP-155A4HDRTJ	Duplex LC	MultiMode	5km
LCP-155B4JDRJ	LCP-155B4JDRTJ	Duplex LC	SingleMode	30km
LCP-155B4MDRJ	LCP-155B4MDRTJ	Duplex LC	SingleMode	60km

**Note:** The actual link distance of a particular fiber optic link depends on the optical budget, the number of connectors and splices, and cabling quantity. Please measure and verify the actual link loss values once the link is established to identify any potential performance issues.

# IEEE 802.11 WLAN

## Functions

Wireless Management .....	35
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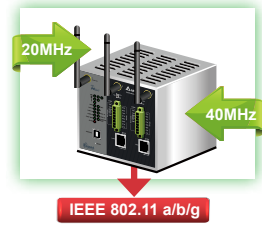
## Wireless AP

DVW-W02W2-E2 Series: Industrial IEEE 802.11 a/b/g/n Wireless AP/WDS/Client/Gateway .....	39
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# IEEE 802.11 WLAN

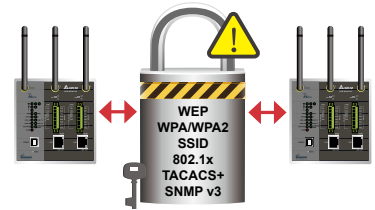
## IEEE 802.11n Technology

The IEEE 802.11n standard is improved with better data rates by Multiple-input and Multiple-output (MIMO) technology. It supports a bandwidth from 20 MHz to 40 MHz that doubles the speed of transmission performance and is compatible with previous IEEE 802.11 a/b/g standards.



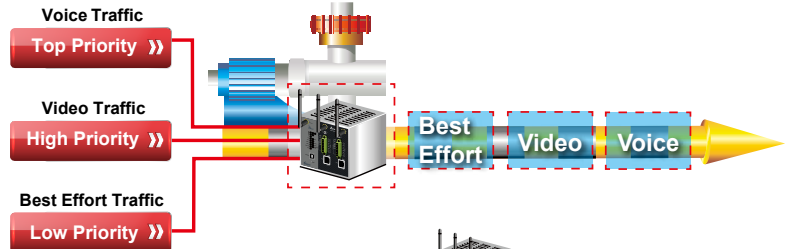
## Enhanced WLAN Security Management

A complete set of security verification tools ensures the security of WLAN for users. Multiple protection mechanisms protect the network from unauthorized access.



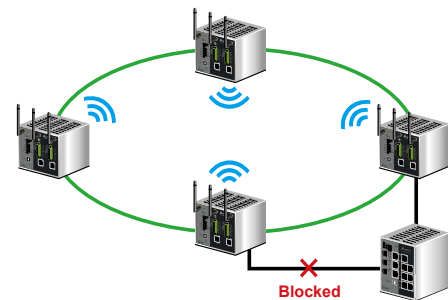
## Wi-Fi Multimedia

Quality of Service (QoS) prioritizes activities in queue, providing exceptional quality for wireless transmission, and is particularly effective for multimedia applications and internet calls.



## STP/RSTP

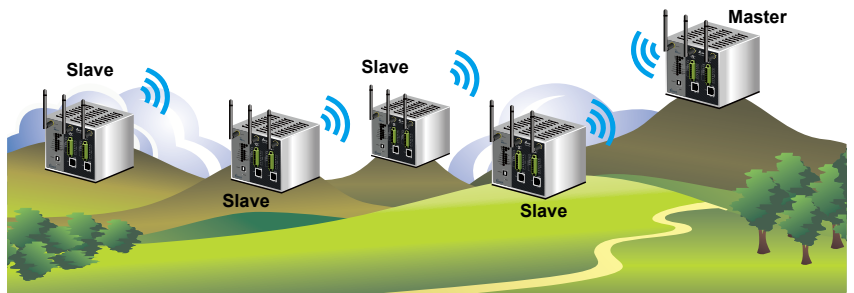
Incorrect wiring frequently causes loops that affect network operation. STP/RSTP protects networks from this type of harm and builds a redundancy path which contributes to a highly reliable network system.



# Versatile Wireless Spot

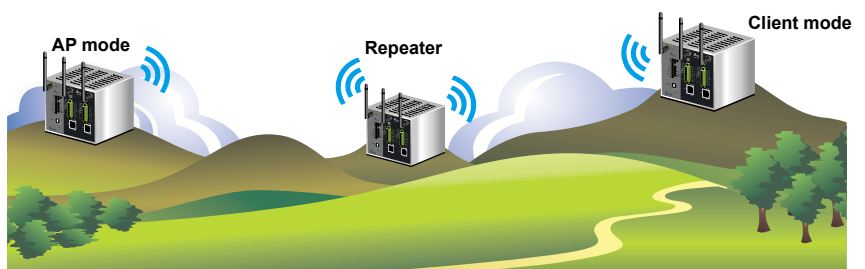
## Wireless Distribution System (WDS) Point-to-Multipoint Mode

Replacing traditional wired LAN extensions, this mode enables a LAN extension of two or more LANs through wireless connection.



## Wireless Distribution System Repeater Mode

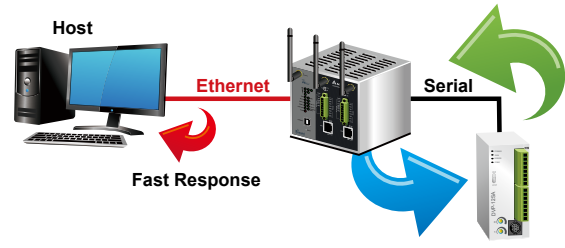
Wireless connection is often limited by the effective transmission distance between two ends. The WDS repeater mode extends the transmission distance to overcome this distance limit.



## MODBUS Cache

- Speeds up data loading time
- Online real-time monitoring

DVW series switches provide a dynamic and constant communication between equipments. Responses are given in no time when the host requests via Ethernet, which significantly improves the data rates of serial equipments.

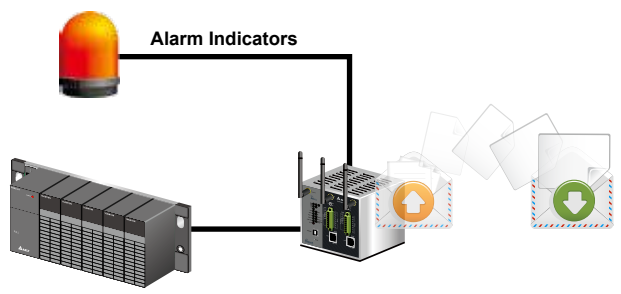


Online Real-time Monitoring

	Station Address	MODBUS (Hex.)	MODBUS (Dec.)	Present Value	Format
1	1	1000	404097	0000	Hex
2	1	1001	404098	0CEF	Hex
3	1	1002	404099	0000	Hex
4	1	1003	404100	0000	Hex
5	1	1004	404101	0000	Hex

## Digital Inputs

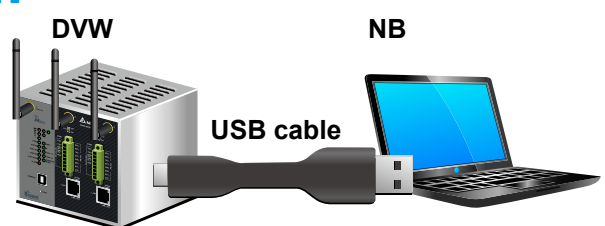
Designed for industrial environments, the DVW series industrial Ethernet switches easily connect to various industrial devices, such as PLCs or sensors. The DVW series delivers real-time alarms to users via relay output or email.



## A Seamless Interconnection

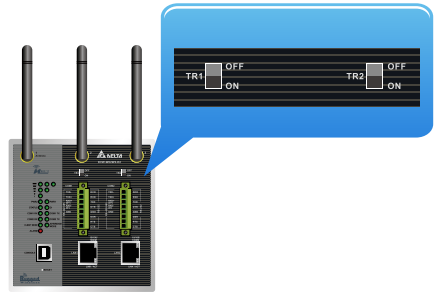
### USB Console Interface

A simple USB cable is all you need to make network management settings.



### Adjustable Terminal Resistors

For applications that use RS-485, signal reflection in cables often causes interference and poor communication quality. Using adjustable terminal resistors that switch on/off according to requirements improves communication quality.

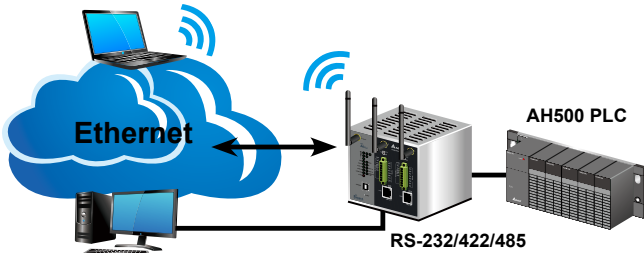


# Introduction to Serial Device Servers

## Virtual COM

The virtual COM mode corresponds the serial port of a DVW to the COM port of a PC, providing users with direct access from a PC to serial communication devices via wired or wireless communication.

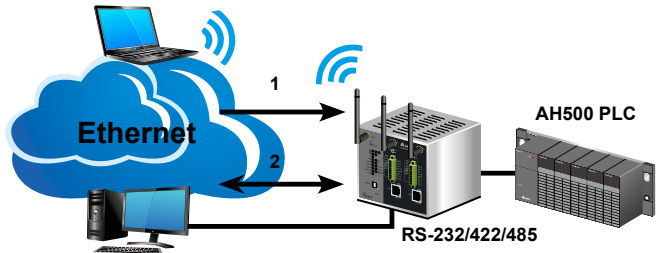
COM6 = 192.168.1.200:2000



COM5 = 192.168.1.100:1000

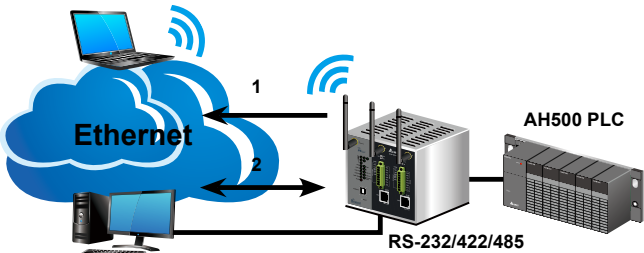
## TCP Server

In a TCP/IP network, each serial port has one exclusive set of IP address and TCP serial port number. When the host requests connection, a DVW passively receives the request for connection and conducts transmission of serial device data via wired or wireless communication.



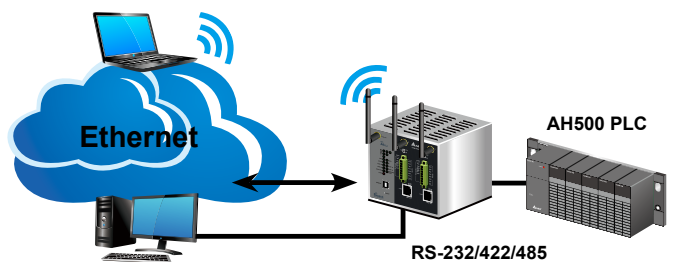
## TCP Client

In a TCP/IP network, each serial port has one exclusive set of IP address and TCP serial port number. When a DVW receives the data of the serial devices connected, it actively requests the host for connection and data transmission via wired or wireless communication. The connection is cut after the data transmission is completed.



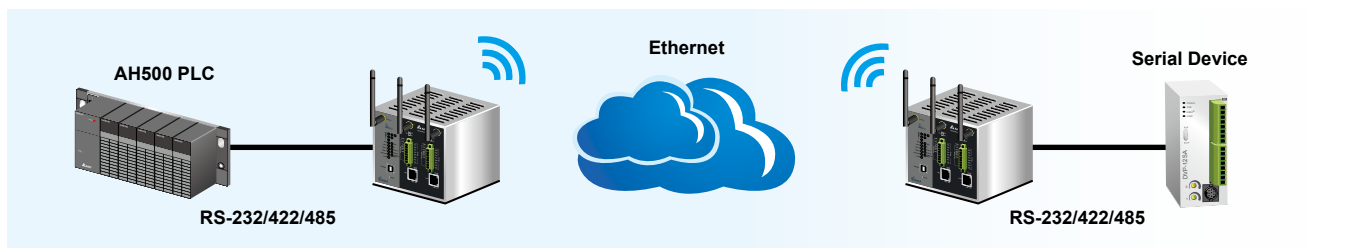
## UDP Mode

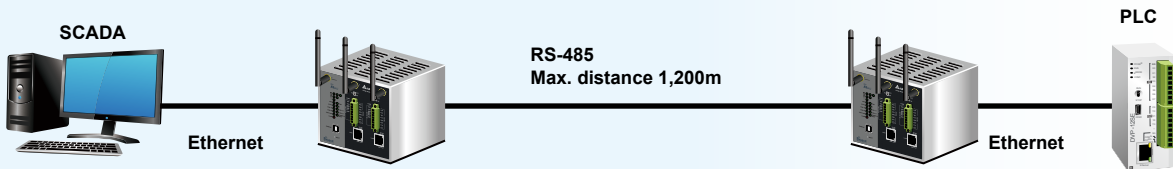
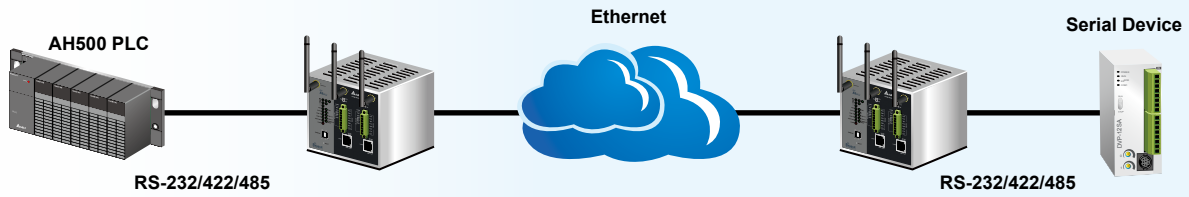
Serial devices can connect to hosts for continuous data transmission via wired or wireless communication with a DVW. The UDP mode enables better transmission performance compared to the TCP mode, and it is suitable for real-time information display systems, such as electronic billboards. It is less applicable to highly critical systems.



## Pair Connection

Pair a DVW with a serial host and another with a serial device. The pairs can use the existing wired or wireless network for communication. When the distance exceeds 100m, replace the network cable with RS-485 for a longer transmission distance of up to 1,200m.

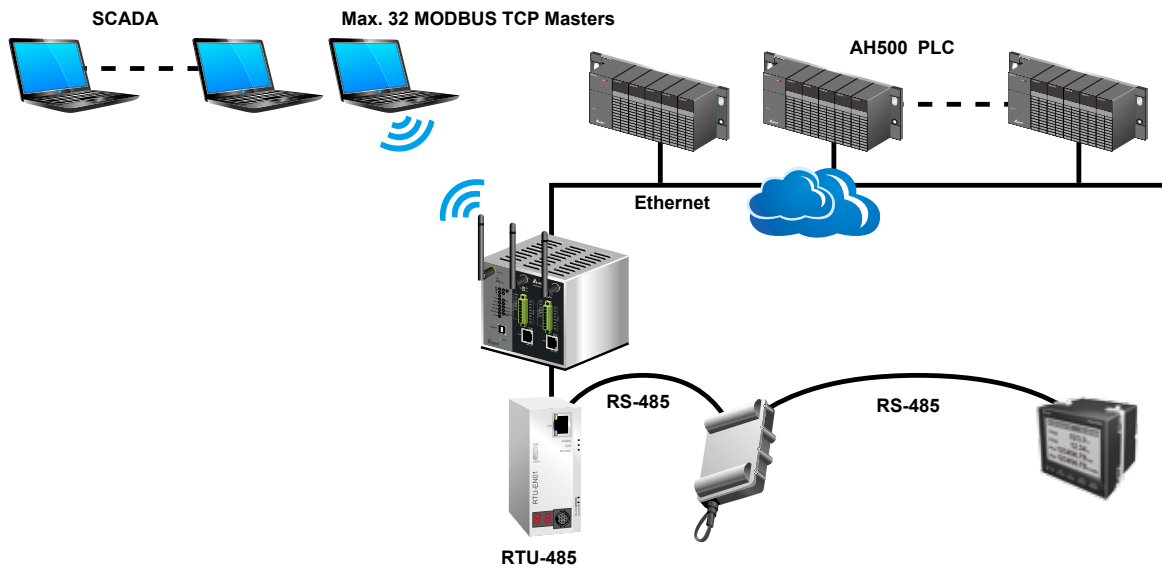




## Introduction to MODBUS Gateway

### ▲ 32 TCP Masters with 32 TCP Slaves

Via wired or wireless communication, up to 32 TCP masters can connect to serial slave devices, and each serial master can connect up to 32 TCP slaves.



## Delta IEXplorer Search Tool

IEXplorer provides users with a friendly access to search for all IES products on the network. One simple click calls for the Web page for software function setting.



# DVW-W02W2-E2

## Industrial IEEE 802.11 a/b/g/n Wireless AP/WDS/Client/Gateway



- ▶ Compliant with IEEE 802.11n wireless technology capable of up to 450Mbps data rate
- ▶ Backward compatible with 802.11 a/b/g standards for seamless integration
- ▶ Multiple Wireless Modes: AP, Client CPE, WDS P-T-P, WDS P-T-MP and Repeater
- ▶ 3 x 3 MIMO technology increases data rate
- ▶ Wireless QoS (IEEE 802.11e, WMM) for video packets precedence transmission
- ▶ Enhanced wireless security: 64/128-bit WEP, WPA/ WPA2, WPA-PSK/WPA2-PSK (TKIP/AES) and 802.1x Authentication
- ▶ Enhanced LAN security: MAC/IP/TCP/UDP filtering, HTTPS, SSL, 802.1X and TACACS+
- ▶ Supports 2-port RS-232/422/485-to-Ethernet Device Server
- ▶ Up to 16 simultaneous connections allows multiple hosts collection
- ▶ Built-in 2-port MODBUS ASCII/RTU to MODBUS TCP Gateway
- ▶ Up to 32 TCP masters or 32 TCP slaves per port at the same time
- ▶ Built-in 20MB buffer memory avoids data loss once the connection is down



- ▶ STP/RSTP for network redundancy further ensures reliability and avoids network loops
- ▶ Automatic IP assignment by DHCP/BootP server for easy network construction
- ▶ SNTP (simple network time protocol) for network clock synchronization
- ▶ Broadcast/Multicast/Unknown Unicast storm control improves throughput problems
- ▶ MAC addresses locking function per Ethernet port blocks unauthorized access
- ▶ USB console interface for easy connection with laptops
- ▶ Supports MODBUS TCP protocol for facilitating the remote management by SCADA or with other industrial devices
- ▶ CPU utilization displays the amount of work the CPU handles
- ▶ Auto warning by email, DI, relay, Syslog & SNMP trap

## Specification

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.11 a/b/g/n Wireless LAN
- IEEE 802.11i Wireless Security
- IEEE 802.11e QoS(WMM)
- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X)
- IEEE 802.3ab 1000Base-T

- IEEE 802.3x Flow Control
- IEEE 802.1D Spanning Tree Protocol
- IEEE 802.1w Rapid Spanning Tree Protocol
- IEEE 802.1Q VLAN Tagging
- IEEE 802.1X Port Authentication

#### Processing Type

- CSMA/CA

### INTERFACE

#### Wireless

- IEEE 802.11 a/b/g/n:**
- 3T3R

#### Antennas:

- 3 2dBi omni-directional, RP-SMA (male) connector



## INTERFACE

### Gigabit Ethernet

#### RJ45 Ports:

- 2 10/100/1000Base-T, auto MDI/MDI-X, auto negotiation

### Serial Communication

#### Serial Ports :

- 2 RS-232/422/485, Terminal Block (8 contacts per port), 2KV isolation protection

#### Baud Rate:

- 110bps to 921.6kbps

#### Data Bits:

- 7, 8

#### Parity:

- None, Even, Odd, Space, Mark

#### Stop Bits:

- 1, 2

#### Flow Control:

- RTS/CTS (RS-232 only), DTR/DSR, XON/XOFF

#### RS-232:

- TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

#### RS-422:

- Tx+, Tx-, Rx+, Rx-, GND

#### RS-485 (2-wire) :

- D+, D-, GND

#### RS-485 (4-wire) :

- Tx+, Tx-, Rx+, Rx-, GND

### Console Port

- USB B-Type connector

### LEDs

#### Wireless Mode:

- Client, AP/WDS

#### Device:

- Signal Strength, Status, PWR1, PWR2, DI, ALARM

#### RJ45 Ports:

- 10/100/1000M, LINK/ACT

#### Serial Ports:

- COM1 RX, COM1 TX, COM2 RX, COM2 TX

### Digital Inputs (DI)

- 1 set
- 0~+5V is OFF
- +11V~30V is ON
- Max. input current 6mA

### Alarm Contacts (DO)

- 1 relay output
- Carry current 2A@24VDC

### Terminal Resistor Switches

- 2 sets, 120KΩ

### Reset Button

- 1 set

## Wireless RF

### RF Modulation

#### 802.11a:

- BPSK, QPSK, 16QAM, 64QAM with OFDM

#### 802.11b:

- DBPSK, DQPSK with DSSS, CCK

#### 802.11g:

- BPSK, QPSK, 16QAM, 64QAM with OFDM

#### 802.11n:

- BPSK, QPSK, 16QAM, 64QAM with MIMO-OFDM

### Frequency Band

2.400GHz ~ 5.850GHz

### Operating Channels

#### US(FCC):

- 2.412GHz ~ 2.462GHz (11 channels)
- 5.180GHz ~ 5.240GHz (4 channels)
- 5.745GHz ~ 5.825GHz (5 channels)

#### EU(ETSI):

- 2.412GHz ~ 2.472GHz (13 channels)
- 5.180GHz ~ 5.240GHz (4 channels)

#### China(SRRC):

- 2.400GHz ~ 2.4835GHz (13 channels)
- 5.725GHz ~ 5.850GHz (5 channels)

#### Taiwan(NCC):

- 2.412GHz ~ 2.462GHz (11 channels)
- 5.280GHz ~ 5.320GHz (3 channels)
- 5.745GHz ~ 5.825GHz (5 channels)

### Data Transmission Rates

#### 802.11n mode:

- up to 450Mbps

#### 802.11a mode:

- 6, 9, 12, 18, 24, 36, 48, 54Mbps

#### 802.11b mode:

- 1, 2, 5.5, 11Mbps

#### 802.11g mode:

- 6, 9, 12, 18, 24, 36, 48, 54Mbps

### RF Output Power (Max., per chain)

#### 802.11a:

- 6Mbps to 24Mbps: 17dBm ( $\pm 2$ dBm)
- 36Mbps: 16dBm ( $\pm 2$ dBm)
- 48Mbps: 14dBm ( $\pm 2$ dBm)
- 54Mbps: 13dBm ( $\pm 2$ dBm)

#### 802.11b (per chain):

- 1Mbps to 11Mbps: 19dBm ( $\pm 2$ dBm)

#### 802.11g:

- 6Mbps to 36Mbps: 19dBm ( $\pm 2$ dBm)
- 48Mbps: 18dBm ( $\pm 2$ dBm)
- 54Mbps: 17dBm ( $\pm 2$ dBm)

### RF Output Power MIMO (Max., per chain)

#### 802.11n (2.4G HT20):

- MCS0~5, 8~13, 16~19: 18dBm ( $\pm 2$ dBm)
- MCS6, 20: 17dBm ( $\pm 2$ dBm)
- MCS14, 21, 22: 16dBm ( $\pm 2$ dBm)
- MCS7, 15, 23: 15dBm ( $\pm 2$ dBm)

#### 802.11n (2.4G HT40):

- MCS0~5, 8~13, 16~19: 17dBm ( $\pm 2$ dBm)
- MCS6, 20, 21: 16dBm ( $\pm 2$ dBm)
- MCS14, 22: 16dBm ( $\pm 2$ dBm)
- MCS7, 14, 15, 23: 15dBm ( $\pm 2$ dBm)

#### 802.11n (5G HT20):

- MCS0~4, 8~12, 16~19: 16dBm ( $\pm 2$ dBm)
- MCS5: 15dBm ( $\pm 2$ dBm)
- MCS6, 13, 20: 14dBm ( $\pm 2$ dBm)
- MCS7, 15, 23: 12dBm ( $\pm 2$ dBm)

#### 802.11n (5G HT40):

- MCS0~4, 8~11, 16~19: 16dBm ( $\pm 2$ dBm)
- MCS5, 12: 15dBm ( $\pm 2$ dBm)
- MCS6, 13, 20: 14dBm ( $\pm 2$ dBm)
- MCS7, 15, 22: 12dBm ( $\pm 2$ dBm)
- MCS23: 11dBm ( $\pm 2$ dBm)

### Receiver Sensitivity

#### 802.11a:

- -93dBm @ 6Mbps, -85dBm @ 36Mbps
- -81dBm @ 48Mbps, -79dBm @ 54Mbps

#### 802.11b:

- -96dBm @ 1Mbps, -90dBm @ 11Mbps

#### 802.11g:

- -94dBm @ 6Mbps, -86dBm @ 36Mbps
- -82dBm @ 48Mbps, -80dBm @ 54Mbps

### Receiver Sensitivity MIMO

#### 802.11n: (5G HT20)

- -93dBm @ MCS0, -81dBm @ MCS5
- -79dBm @ MCS6, -76dBm @ MCS7

#### 802.11n: (5G HT40)

- -90dBm @ MCS0, -79dBm @ MCS5
- -75dBm @ MCS6, -74dBm @ MCS7

#### 802.11n: (5G HT20)

- -91dBm @ MCS0, -79dBm @ MCS5
- -77dBm @ MCS6, -74dBm @ MCS7

#### 802.11n: (5G HT40)

- -89dBm @ MCS0, -77dBm @ MCS5
- -73dBm @ MCS6, -72dBm @ MCS7

## MANAGEMENT

### Software

- STP/RSTP, QoS, VLAN, SSH, DNS, HTTP, HTTPS, RADIUS, TACACS+, SNMP v1/v2c/v3, SNMP Traps, TFTP, BootP Server/Client, DHCP Server/Client, Telnet, Syslog, SMTP, SNTIP Server/Client, ARP, MODBUS TCP

### Security

- Security Access:**
- MAC/IP/TCP/UDP filtering, HTTPS, SSH, 802.1X, TACACS+, SNMP v3
- Wireless Security:**
- 802.11i, 64/128-bit WEP, WPA/WPA2, WPA-PSK/WPA2-PSK (TKIP/AES)
  - SSID Broadcast: Enable/Disable
- Virtual COM Drivers**
- Windows 2000, Windows XP
  - Windows Vista (32/64 bits)
  - Windows 7 (32/64 bits)

### Configuration

- Web Browser, Cisco-like Telnet CLI, USB Local Console, SNMP, MODBUS TCP, IEXplorer Utility
- MIB**
- MIB II, RS-232 MIB, System Group MIB, SNMP MIB, Interface Group MIB, TCP MIB, UDP MIB, IP MIB, Delta Private MIB

## POWER REQUIREMENTS

### Input Voltage

- 2 sets, 12 to 48 VDC redundant terminal block input

### Input Current

- Max. 1.02A

### Overload Current Protection:

- Present, max. input current 3A

### Reverse Polarity Protection

- Present

### Buffer Time

- Min. 12ms at 24VDC

## PHYSICAL

### Housing

- IP40 metal case

### Dimensions

- 145.3 mm (H) x 112.5 mm (W) x 108.7 mm (D)

### Weight

- 500g

### Installation

- Industrial DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -40°C to 75°C (-40°F to 167°F)

### Storage Temperature

- -40°C to 85°C (-40°F to 185°F)

### Ambient Relative Humidity

- 5% to 95% (non-condensing)

## APPROVALS

### Safety

- UL 508, EN 60950-1, IEC 61131-2

### EMI

- FCC 47 CFR Part 15 Subpart B Class A,
- IEC 61000-6-4, EN 55022(CISPR22), EN 301 489-1/17

### EMS

[EN 301 489-1/17, IEC 61000-6-2, EN 55024(CISPR24)]

- IEC 61000-4-2 level 3, IEC 61000-4-3 level 3,
- IEC 61000-4-4 level 4, IEC 61000-4-5 level 3,
- IEC 61000-4-6 level 3, IEC 61000-4-8 level 4,
- IEC 61000-4-29

### RF

- EN 300 328, EN 301 893, NCC, SRRC
- FCC 47 CFR Part 15 Subpart C, E

### Environmental Type Tests

#### Cold Temperature:

- IEC 60068-2-1

#### Dry Heat:

- IEC 60068-2-2

#### Humidity:

- IEC 60068-2-30

#### Shock:

- IEC 60255-21-2

#### Freefall:

- IEC 60068-2-32

#### Vibration:

- IEC 60068-2-6

#### Hi-Pot:

- 1.5KV

## Ordering Information

Product		Port Combination		Interface			RF	Region
Model Name	Operating Temperature	10/100/1000 Base-T	RS-232/422/485	DI	DO (Relay)	Power Input	Band	
DVW-W02W2-E2	-40°C to 75°C	2	2	1	1	2	US	USA, Taiwan
DVW-W02W2-E2-EU	-40°C to 75°C	2	2	1	1	2	EU	European Union
DVW-W02W2-E2-CN	-40°C to 75°C	2	2	1	1	2	CN	China

### Optional Products

DVP/CliQ/PMC Series: 12/24 VDC Industrial Power Supply

# Ethernet Gateways

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# IFD9506 Series

## Industrial 1-Port Serial-to-Ethernet MODBUS Gateway



UL508

EMC  
LEVEL 3

FANLESS

- ▶ Standard MODBUS TCP protocol with universal compatibility
- ▶ MODBUS RS-232/485 to MODBUS TCP gateway
- ▶ MODBUS TCP server connections: 16 (serial master mode)
- ▶ MODBUS TCP client connections: 8 (serial slave mode)
- ▶ Connectable to various devices and Ethernet ports with user-defined format
- ▶ Serial servers support simultaneous duplex transmissions of user-defined data (1 on 1)
- ▶ Isolation in RS-485 channel for stable communication
- ▶ Smart Monitor function for faster response from the Ethernet end in serial master mode
- ▶ Provides Web browser settings and real-time monitoring of terminal devices
- ▶ Virtual COM enables Ethernet communication for software that only supports serial
- ▶ Real-time automatic alarm notifications through email when triggered by DI
- ▶ IP filter function for enhanced network security



## Specification

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X)

### INTERFACE

#### RJ45 Ports:

- 1 10/100Base-T(X), auto MDI/MDI-X, auto negotiation

#### Serial Communication

##### Serial Ports:

- 1 RS-232/485, 2KV isolation protection

##### Baud Rate:

- 110bps to 115.2kbps

##### Data Bits:

- 7, 8

#### Parity:

- None, Even, Odd,

#### Stop Bits:

- 1, 2

#### RS-232:

- TxD, RxD, GND

#### RS-485 (2-wire):

- D+, D-, GND

#### LEDs

##### Device:

- Power

#### RJ45 Ports:

- LINK/ACT

#### RS485 Ports:

- Rx

#### Digital Inputs (DI)

- 3 sets
- 0~+5V is OFF
- +15V~+30V is ON
- Max. input current 5mA

#### Reset Button

- 1 set

### MANAGEMENT

#### Protocol

- ICMP, IP, TCP, UDP, DHCP, SMTP, MODBUS TCP

#### Security

##### Security Access:

- IP filtering

#### Virtual COM Drivers

- Windows 2000, Windows XP, Windows Vista (32/64 bits), Windows 7 (32/64 bits)

#### Configuration

- DCISoft, Web Browser, IEXplorer Utility

## POWER REQUIREMENTS

### Input Voltage

- 20.4 to 28.8 VDC terminal block input

### Input Current

- Max. 0.15A

### Overload Current Protection

- Present, Max. input current 0.17A

### Reverse Polarity Protection

- Present

### Buffer Time

- Min. 10ms at 24VDC

## PHYSICAL

### Dimensions

- 110.8 mm (H) x 71 mm (W) x 33 mm (D)

### Weight

- 140g

### Installation

- Industrial DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- 0°C to 55°C (32°F to 131°F)

### Storage Temperature

- -25°C to 70°C (-13°F to 158°F)

### Ambient Relative Humidity

- 5% to 95% (non-condensing)

## APPROVALS

### Safety

- UL 508, IEC 61131-2

### EMI

- IEC 61000-6-4

### EMS (IEC 61000-6-2)

- IEC 61000-4-2 Level 3, IEC 61000-4-3 Level 3
- IEC 61000-4-4 Level 3, IEC 61000-4-5 Level 1
- IEC 61000-4-6 Level 2

### Environmental Type Tests

#### Cold Temperature:

- EN 61131-2

#### Dry Heat:

- EN 61131-2

#### Humidity:

- EN 61131-2-6.1.3

#### Shock:

- EN 61131-2

#### Freefall:

- EN 61131-2 6.2.4

#### Vibration:

- EN 61131-2

#### Hi-Pot:

- 500V

## Ordering Information

Product		Port Combination		Interface		
Model Name	Operating Temperature	10/ 100Base-T(X)	RS-232/485	DI	DO (Relay)	Power Input
IFD9506	0°C to 55°C	1	1	3	---	1

### Optional Products

DVP/CiQ/PMC Series: 12/24 VDC Industrial Power Supply

# IFD9507 Series

## Industrial 1-Port MODBUS Serial-to-EtherNet/IP Gateway



UL508

EMC  
LEVEL 3

FANLESS

- ▶ Standard EtherNet/IP and MODBUS TCP protocol with universal compatibility
- ▶ EtherNet/IP to MODBUS RS-232/485 Gateway
- ▶ Supports EtherNet/IP protocol
- ▶ EtherNet/IP server connections: 16 [Explicit Message, Implicit Message (cyclic) : 1]
- ▶ EtherNet/IP client connection: 4 (I/O connection only)
- ▶ MODBUS RS-232/485 to MODBUS TCP gateway
- ▶ MODBUS TCP server connections: 16 (serial master mode)
- ▶ MODBUS TCP client connections: 8 (serial slave mode)
- ▶ Connectable to various devices and Ethernet ports with user-defined format
- ▶ Isolation in RS-485 channel for stable communication
- ▶ Smart Monitor function for faster response from the Ethernet end in serial master mode
- ▶ Provides Web browser settings and real-time monitoring of terminal devices
- ▶ Virtual COM enables Ethernet communication for software that only supports serial
- ▶ Real-time automatic alarm notifications through email when triggered by DI
- ▶ IP filter function for enhanced network security



## Specification

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X)

### INTERFACE

#### RJ45 Ports:

- 1 10/100Base-T(X), auto MDI/MDI-X, auto negotiation

#### Serial Communication

##### Serial Ports:

- 1 RS-232/485, 2KV isolation protection

##### Baud Rate:

- 110bps to 115.2kbps

##### Data Bits:

- 7, 8

#### Parity:

- None, Even, Odd,

#### Stop Bits:

- 1, 2

#### RS-232:

- TxD, RxD, GND

#### RS-485 (2-wire):

- D+, D-, GND

#### LEDs

##### Device:

- Power

#### RJ45 Ports:

- LINK/ACT

#### RS485 Ports:

- Rx

#### Digital Inputs (DI)

- 3 sets
- 0~+5V is OFF
- +15V~+30V is ON
- Max. input current 5mA

#### Reset Button

- 1 set

### MANAGEMENT

#### Protocol

- ICMP, IP, TCP, UDP, DHCP, SMTP, MODBUS TCP, EtherNet/IP

#### Security

##### Security Access:

- IP filtering

#### Virtual COM Drivers

- Windows 2000, Windows XP, Windows Vista (32/64 bits), Windows 7 (32/64 bits)

#### Configuration

- DCISoft, Web Browser, IEXplorer Utility

## POWER REQUIREMENTS

### Input Voltage

- 20.4 to 28.8 VDC terminal block input

### Input Current

- Max. 0.15A

### Overload Current Protection

- Present, max. input current 0.17A

### Reverse Polarity Protection

- Present

### Buffer Time

- Min. 10ms at 24VDC

## PHYSICAL

### Dimensions

- 110.8 mm (H) x 71 mm (W) x 33 mm (D)

### Weight

- 140g

### Installation

- Industrial DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- 0°C to 55°C (32°F to 131°F)

### Storage Temperature

- -25°C to 70°C (-13°F to 158°F)

### Ambient Relative Humidity

- 5% to 95% (non-condensing)

## APPROVALS

### Safety

- UL 508, IEC 61131-2

### EMI

- IEC 61000-6-4

### EMS (IEC 61000-6-2)

- IEC 61000-4-2 Level 3, IEC 61000-4-3 Level 3
- IEC 61000-4-4 Level 3, IEC 61000-4-5 Level 1
- IEC 61000-4-6 Level 2

### Environmental Type Tests

#### Cold Temperature:

- EN 61131-2

#### Dry Heat:

- EN 61131-2

#### Humidity:

- EN 61131-2-6.1.3

#### Shock:

- EN 61131-2

#### Freefall:

- EN 61131-2 6.2.4

#### Vibration:

- EN 61131-2

#### Hi-Pot:

- 500V

## Ordering Information

Product		Port Combination		Interface		
Model Name	Operating Temperature	10/ 100Base-T(X)	RS-232/485	DI	DO (Relay)	Power Input
IFD9507	0°C to 55°C	1	1	3	---	1

### Optional Products

DVP/DRP/PMC Series: 12/24 VDC Industrial Power Supply



Smarter. Greener. Together.

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