



Automation for a Changing World

Delta Industrial Ethernet

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 of 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 a 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

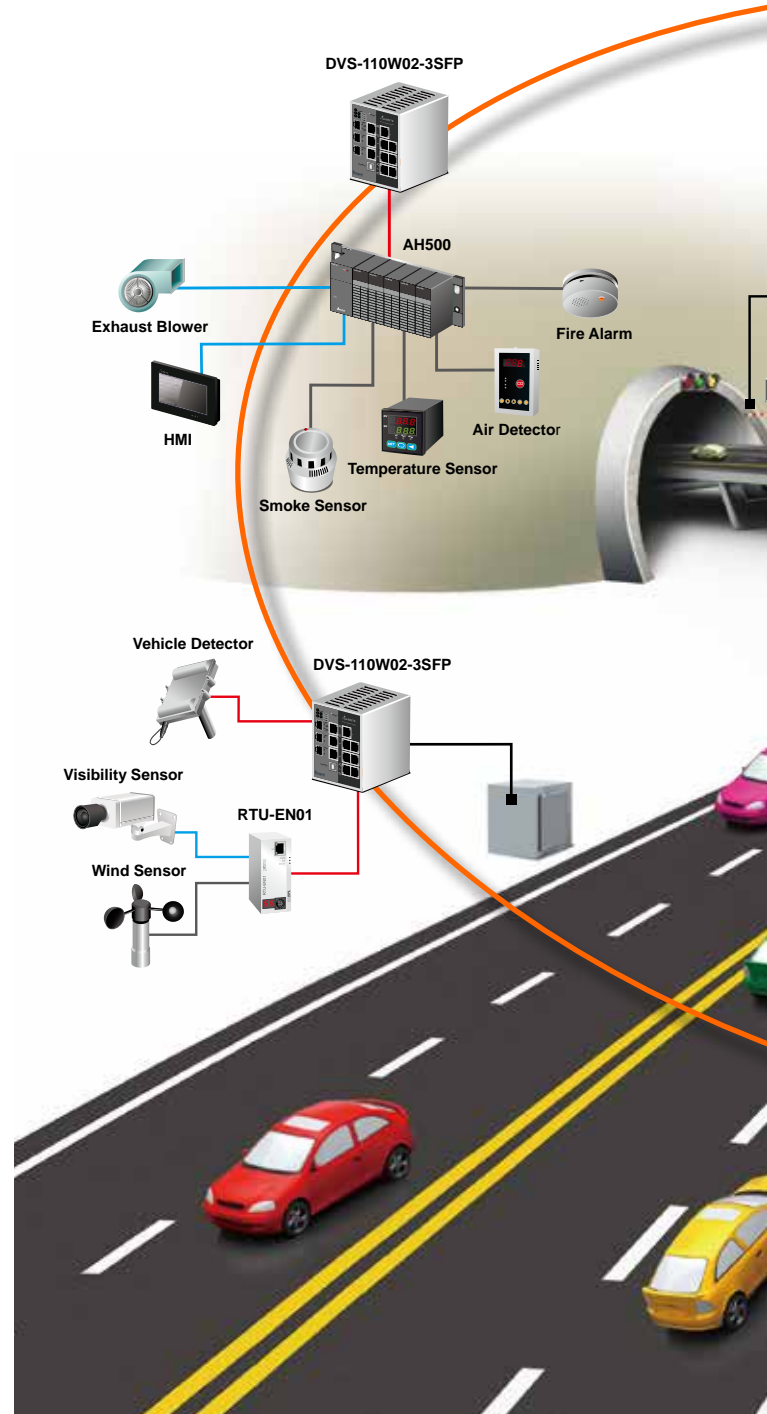
- ▶ Full GbE ports to enhance transmission bandwidth
- ▶ Jumbo frame size up to 9216 Bytes
- ▶ IP40 metal case, -10°C to 60°C operating temperature

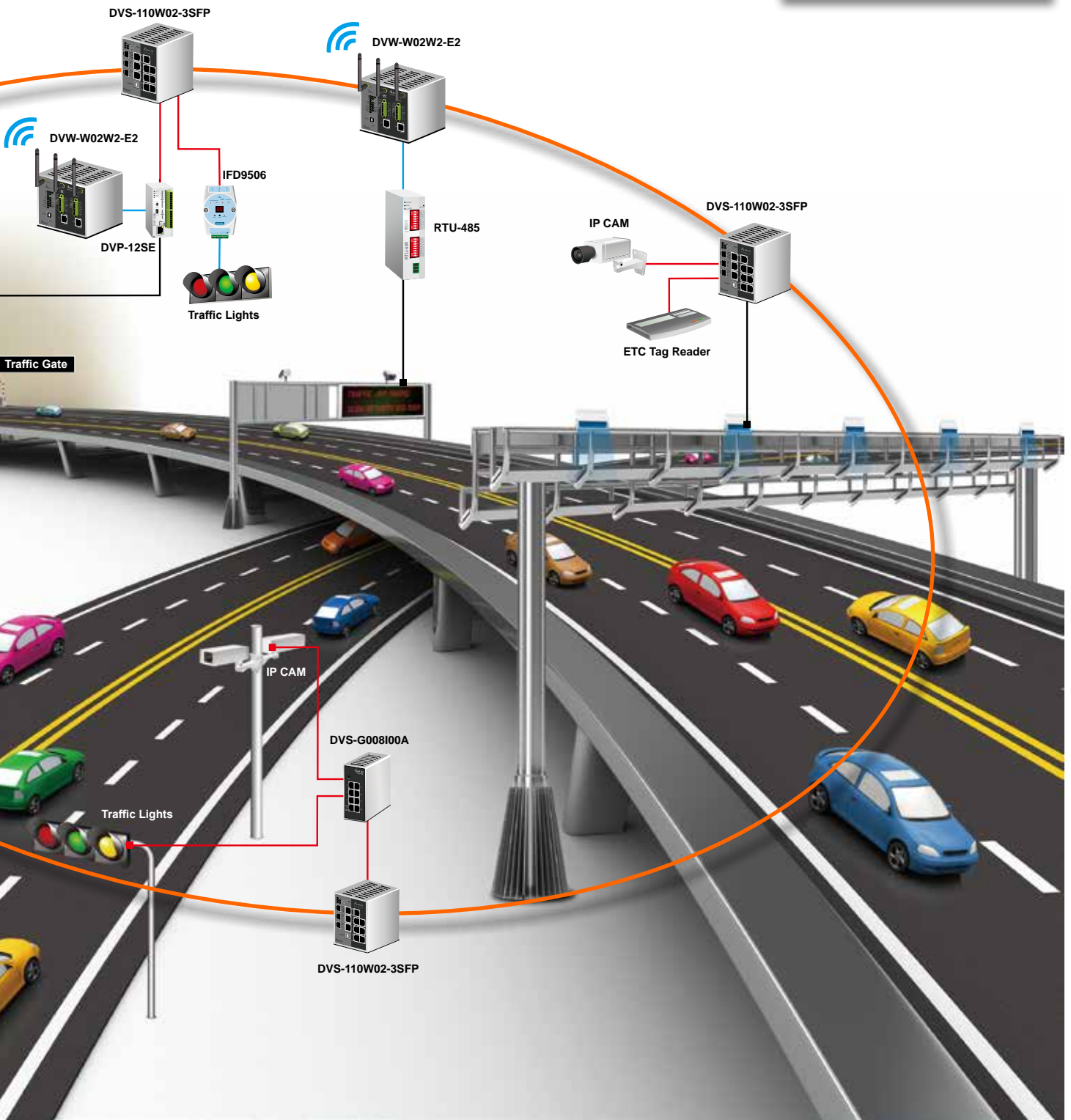
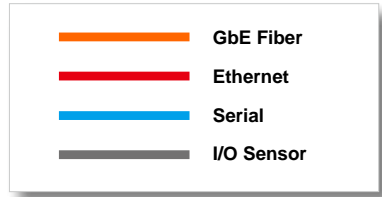


IFD9506

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

- ▶ 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



DVS-016 Series

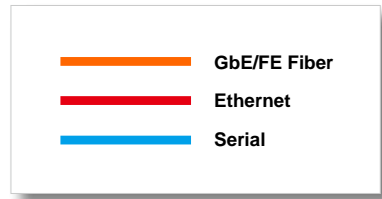
16-port FE Unmanaged Ethernet Switch

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



Control Center





Ethernet Switches

Functions

Layer 2 Network Management	8
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Managed Switches

DVS-110 Series: Managed Industrial 7-Port FE + 3-Port GbE Combo 100/1000Base-SFP Ethernet Switches	11
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Unmanaged Switches

DVS-G008I/G005I00A Series: Unmanaged Industrial 5 and 8-Port GbE Ethernet Switches	14
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SFP Fiber Transceivers

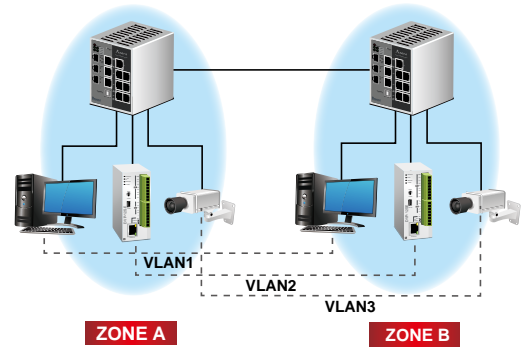
LCP-GbE Series: 1-Port Gigabit Ethernet SFP Fiber Transceiver	22
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Layer 2 Network Management

Advanced Network Management

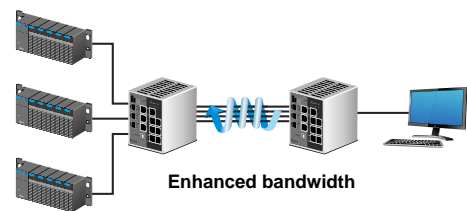
VLAN

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.



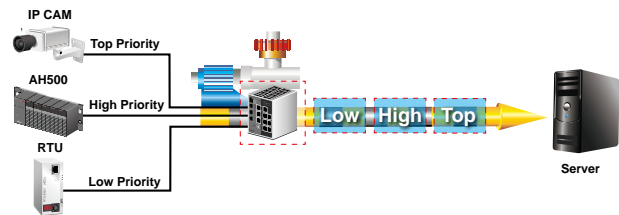
Trunking

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.



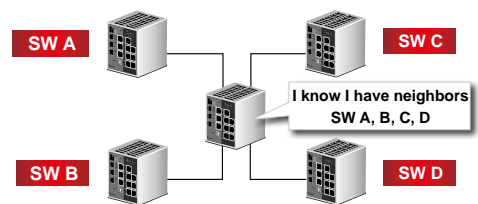
Quality of Service (QoS)

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.



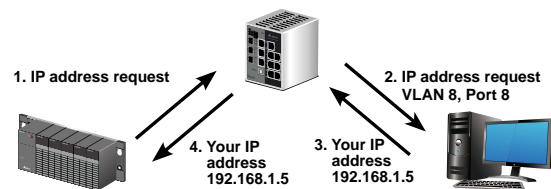
Link Layer Discovery Protocol (LLDP)

The LLDP protocol is used by network devices for advertising their identity, capabilities, and any updates to neighboring devices on an IEEE 802.ab network. These messages are stored in SNMP MIB and can be searched through a network management system.



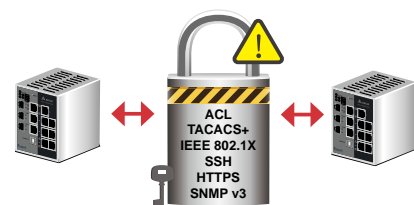
DHCP Relay Option 82 IP Assignment

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.



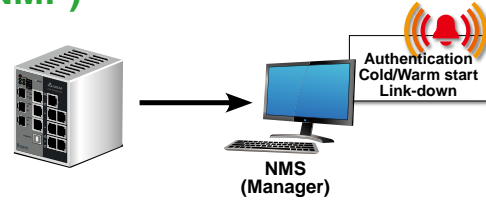
Enhanced Network Security Management

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.



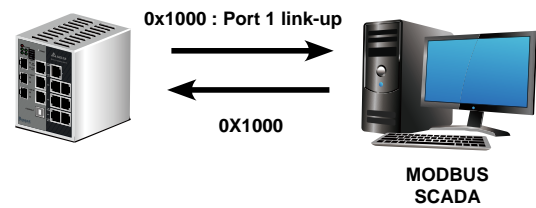
Simple Network Management Protocol (SNMP)

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

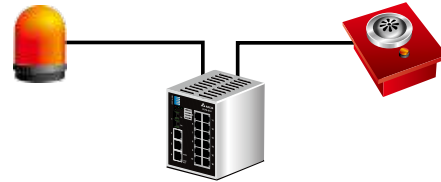
Delta Managed Ethernet Switches support MODBUS TCP protocol for easy integration with an on-site industrial network management system. Users can monitor and manage the operational status via the graphical interface of Supervisory Control and Data Acquisition (SCADA) at any time. The consistency of communication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



Smart Functions Well-tailored to Your Needs

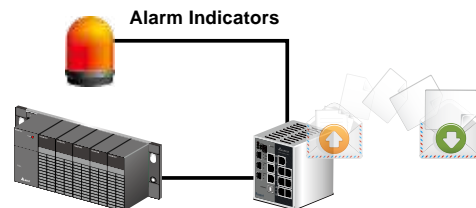
Relay Output for Event Alarms

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.



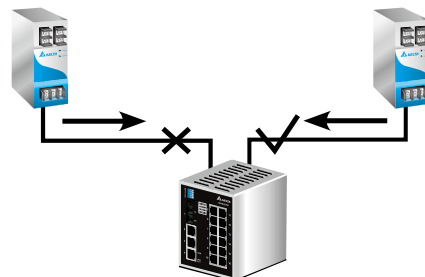
Digital Inputs

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

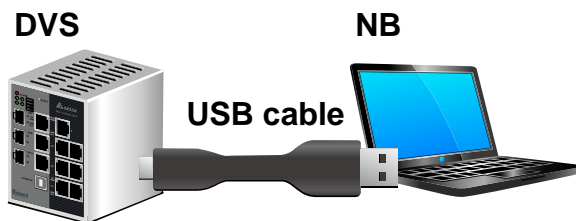
The design of dual power inputs provides excellent integration with the common dual power supply design of critical systems, or with industrial environments. It secures switches from potential power impact and provides highly-reliable and uninterrupted network transmission.



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.



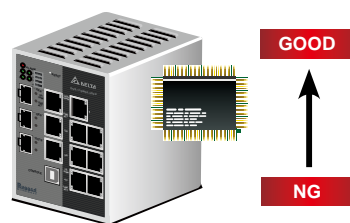
SFP DDM

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.

SFP DDM											
Port	Status	Temperature		Voltage		Bias		Tx Power		Rx Power	
		Current	Range	Current	Range	Current	Range	Current	Range	Current	Range
0/8	Present	45.9°C	-5.0 - 85.0	3.3 V	3.1 - 3.5	15.0 mA	0.0 - 45.0	-11.1 dBm	-14.1 - -8.1	-15.4 dBm	-23.0 - -5.0

Watch Dog Timer

The hardware Watch Dog Timer restores switches from malfunctions caused by any reason, 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 3



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
- ▶ SNMP v1/v2c/v3 facilitates the exchange of management between network devices
- ▶ Supports MODBUS TCP protocol that facilitates the remote management by SCADA and other industrial devices
- ▶ STP/RSTP/MSTP for network redundancy further ensures reliability
- ▶ QoS (IEEE 802.1p) and TOS/DSCP for mission-critical applications
- ▶ IEEE 802.1Q VLAN, Port-based VLAN 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
- ▶ 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 works 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

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 5A@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 Relay, DHCP Relay Option 82, DHCP Option 66/67, Telnet, Syslog, SMTP, SMTP Server/Client, IPv6, MODBUS TCP

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 aluminum 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

EMS (IEC 61000-6-2)

- 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-FX/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

Specification

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 aluminum 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

EMS (IEC 61000-6-2)

- 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 5A@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 aluminum metal case

Dimensions

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

Weight

- 490g

Installation

- Industrial DIN-Rail and wall mounting

Specification

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

EMS (IEC 61000-6-2)

- 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 5A@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

Specification

PHYSICAL

Housing

- IP40 aluminum 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

EMS (IEC 61000-6-2)

- 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 5A@24VDC

PERFORMANCE AND SCALABILITY

Switching Capacity

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

Forwarding Rate

- 1.5Mpps

MAC Address Table

- 1K

Packet Buffer Memory

- 512M 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 aluminum metal case

Dimensions

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

Weight

- 300g

Installation

- Industrial DIN-Rail and wall mounting

Specification

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

EMS (IEC 61000-6-2)

- 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

Specification

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 SFP Fiber Transceiver

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 μ m MultiMode	9/125 μ m SingleMode	9/125 μ 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

Specification

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 27

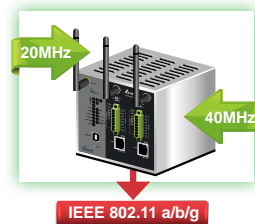
Wireless AP

DVW-W02W2-E2 Series: Industrial IEEE 802.11 a/b/g/n Wireless AP/WDS/Client/Gateway 31

IEEE 802.1 WLAN

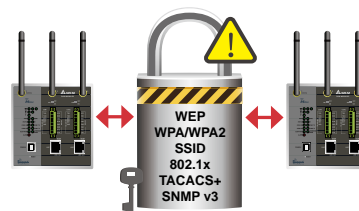
IEEE 802.11n Technology

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.



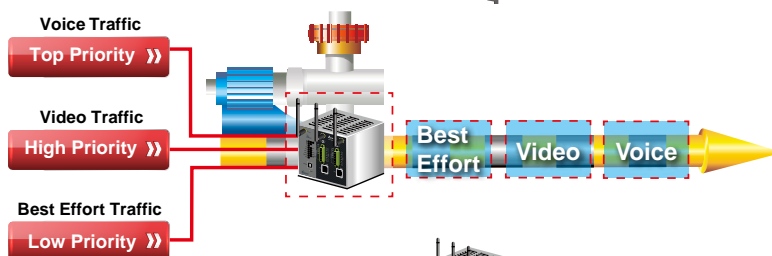
Enhanced WLAN Security Management

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



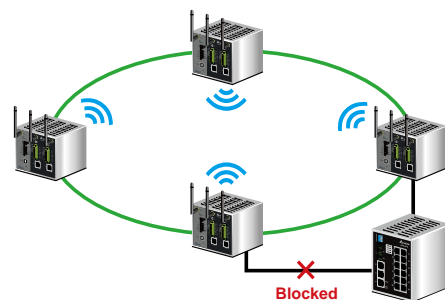
Wi-Fi Multimedia

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

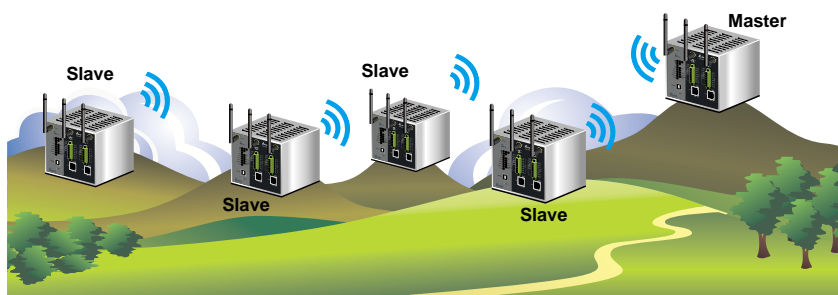
Incorrect wiring frequently causes loops that affect network operation. STP/RSTP protects networks from this type of harm and builds a redundancy path which contributes to a highly reliable network system.



Versatile Wireless Spot

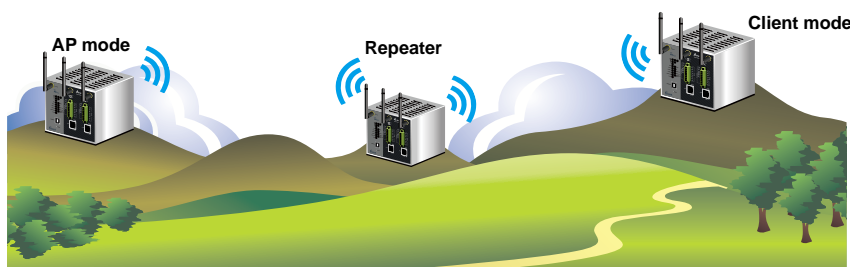
Wireless Distribution System (WDS) Point-to-Multipoint Mode

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



Wireless Distribution System Repeater Mode

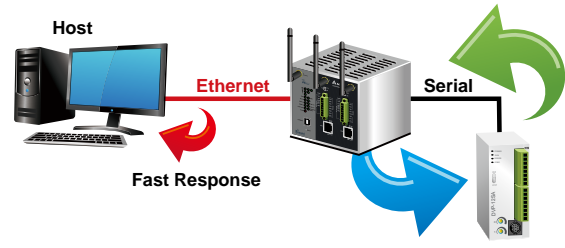
Wireless connection is often limited by the effective transmission distance between two ends. The WDS repeater mode extends the transmission distance to overcome this distance limit.



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.

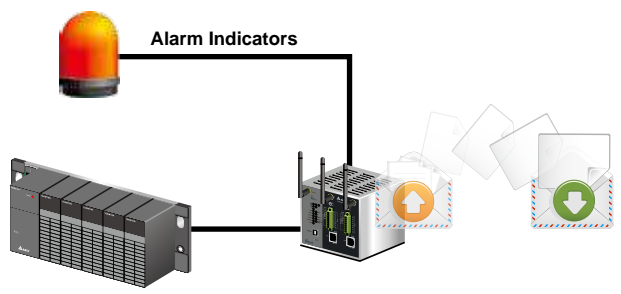


Online Real-time Monitoring

	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

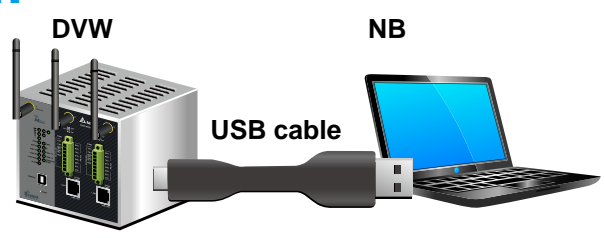
Designed for industrial environments, the DVW series industrial Ethernet switches easily connect to various industrial devices, such as PLCs or sensors. The DVW series delivers real-time alarms to users via relay output or email.



A Seamless Interconnection

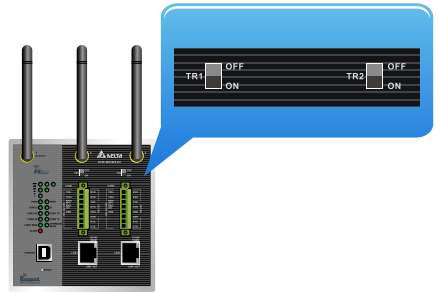
USB Console Interface

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.

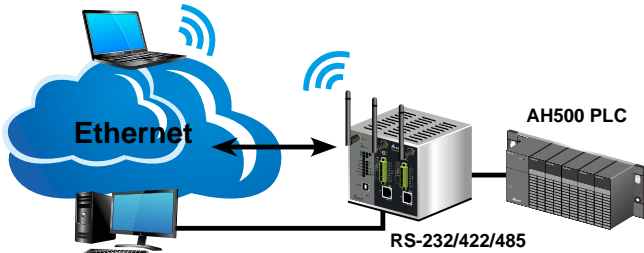


Introduction to Serial Device Servers

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.

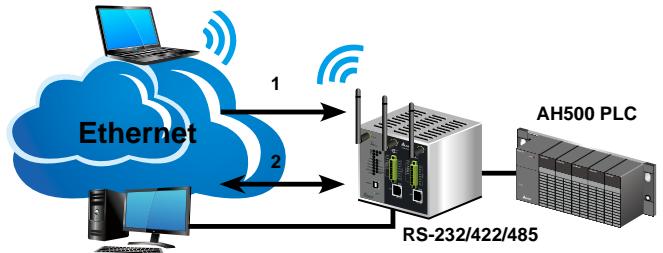
COM6 = 192.168.1.200:2000



COM5 = 192.168.1.100:1000

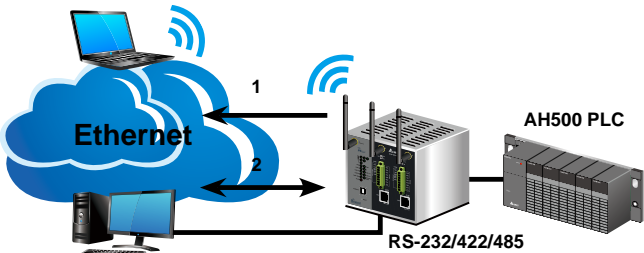
TCP Server

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.



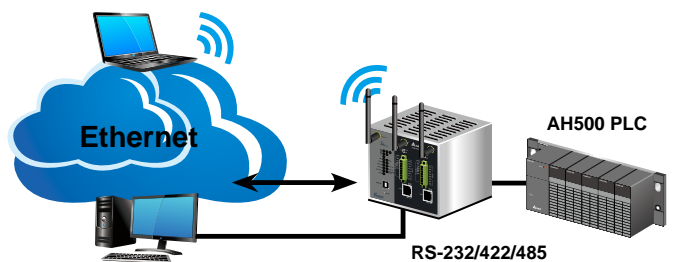
TCP Client

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.



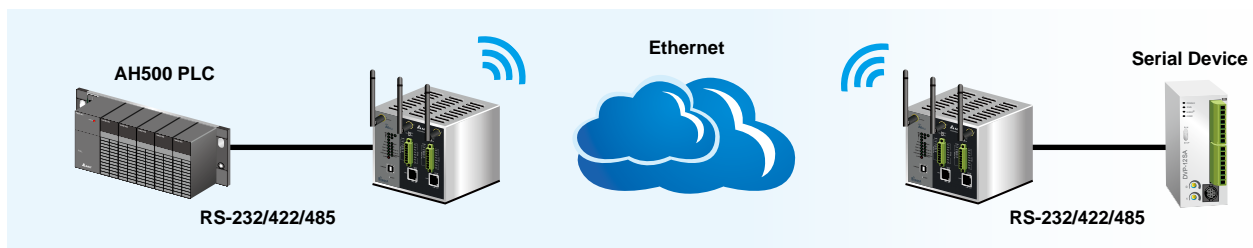
UDP Mode

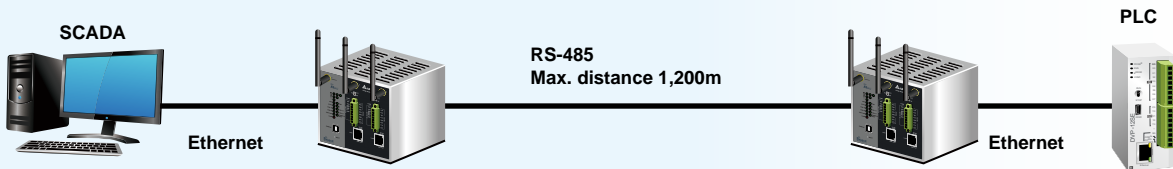
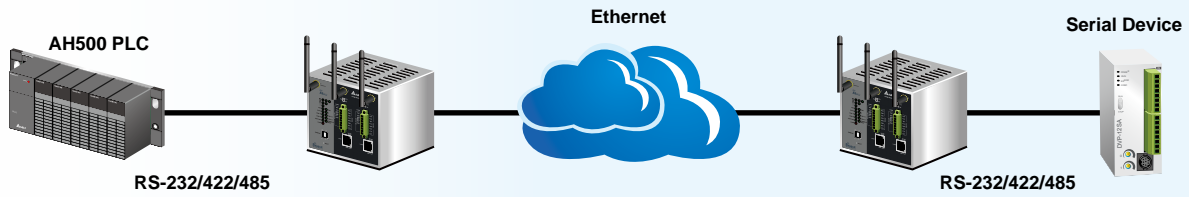
Serial devices can connect to hosts for continuous data transmission via wired or wireless communication with a DVW. The UDP mode enables better transmission performance compared to the TCP mode, and it is suitable for real-time information display systems, such as electronic billboards. It is less applicable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

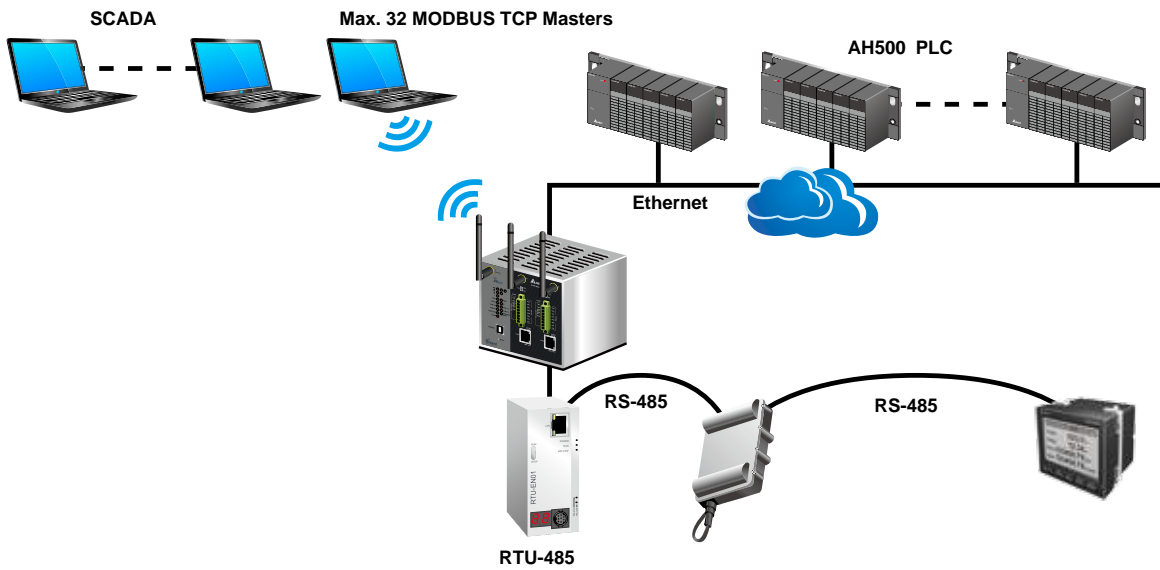




Introduction to MODBUS Gateway

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

Rugged
WIRELESS



- ▶ 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 works 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

Specification

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 5A@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

2.412GHz ~ 5.825GHz

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):

- 2.412GHz ~ 2.472GHz (13 channels)
- 5.745GHz ~ 5.825GHz (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 (± 2 dBm)
- 36Mbps: 16dBm (± 2 dBm)
- 48Mbps: 14dBm (± 2 dBm)
- 54Mbps: 13dBm (± 2 dBm)

802.11b (per chain):

- 1Mbps to 11Mbps: 19dBm (± 2 dBm)

802.11g:

- 6Mbps to 36Mbps: 19dBm (± 2 dBm)
- 48Mbps: 18dBm (± 2 dBm)
- 54Mbps: 17dBm (± 2 dBm)

RF Output Power MIMO (Max., per chain)

802.11n (2.4G HT40):

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

802.11n (2.4G HT20):

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

802.11n (5G HT20):

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

802.11n (5G HT40):

- MCS0~4, 8~11, 16~19: 16dBm (± 2 dBm)
- MCS5, 12: 15dBm (± 2 dBm)
- MCS6, 13, 20: 14dBm (± 2 dBm)
- MCS7, 15, 22: 12dBm (± 2 dBm)
- MCS23: 11dBm (± 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, SNTTP 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 aluminum 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, CCC

EMI

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

EMS

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

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	10/100/1000 Base-T	RS-232/422/485	DI	DO (Relay)	Power Input
DVW-W02W2-E2	-40°C to 75°C	2	2	1	1	2

Optional Products

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

Ethernet Gateways

Protocol Gateways	
IFD9506 Series: Industrial 1-Port Serial-to-Ethernet MODBUS Gateway	35
IFD9507 Series: Industrial 1-Port MODBUS Serial-to-EtherNet/IP Gateway	37



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 support serial
- ▶ Real-time automatic alarm notifications through emails 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

Specification

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 support serial
- ▶ Real-time automatic alarm notifications through emails 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

Specification

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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*We reserve the right to change the information in this catalogue without prior notice.