



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 industrial Ethernet products IES Series 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

#### Managed 10-Port 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

- ▶ 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-G008I00A

#### Unmanaged 8-Port FE Ethernet Switch

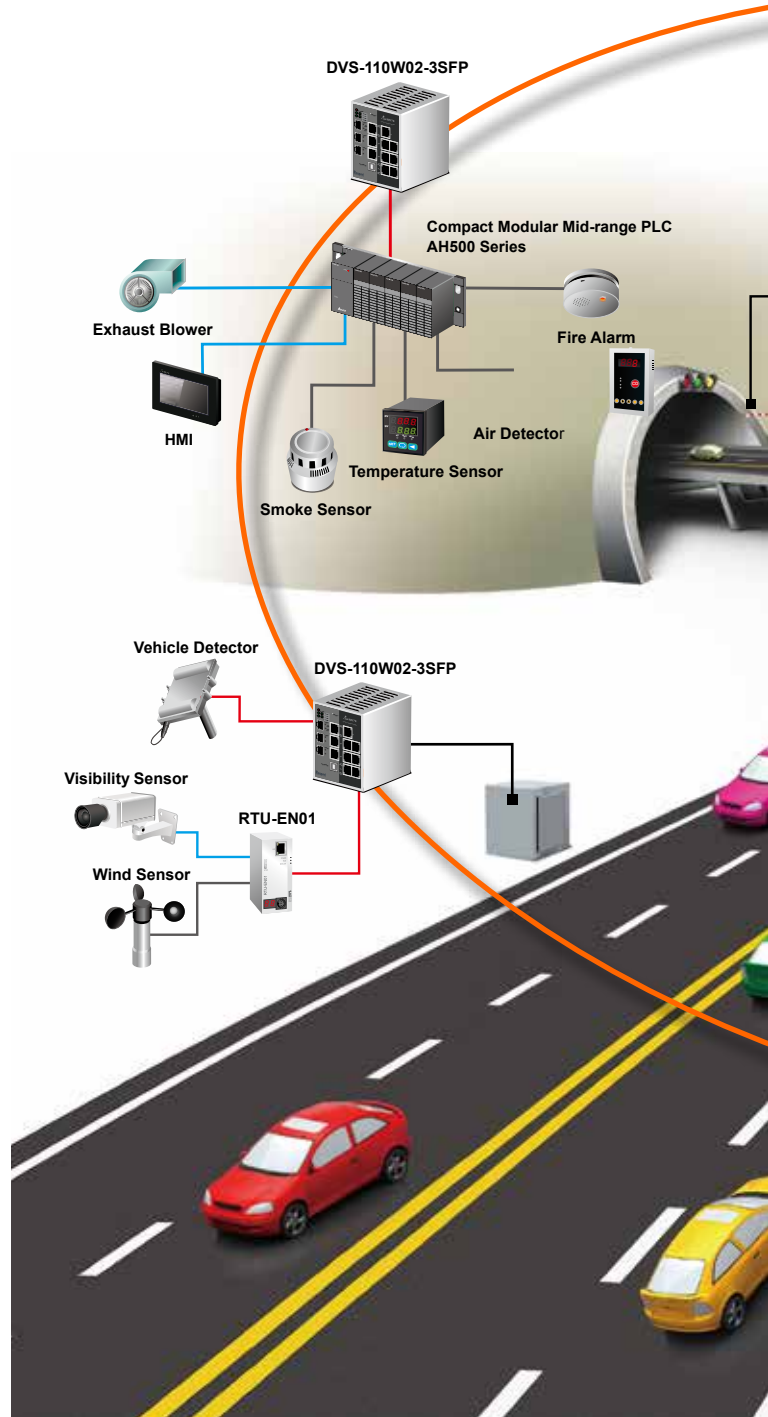
- ▶ Full GbE ports to enhance transmission bandwidth
- ▶ Jumbo frame size up to 9216 Bytes
- ▶ IP40 metal case, -10°C to 60°C operating temperature

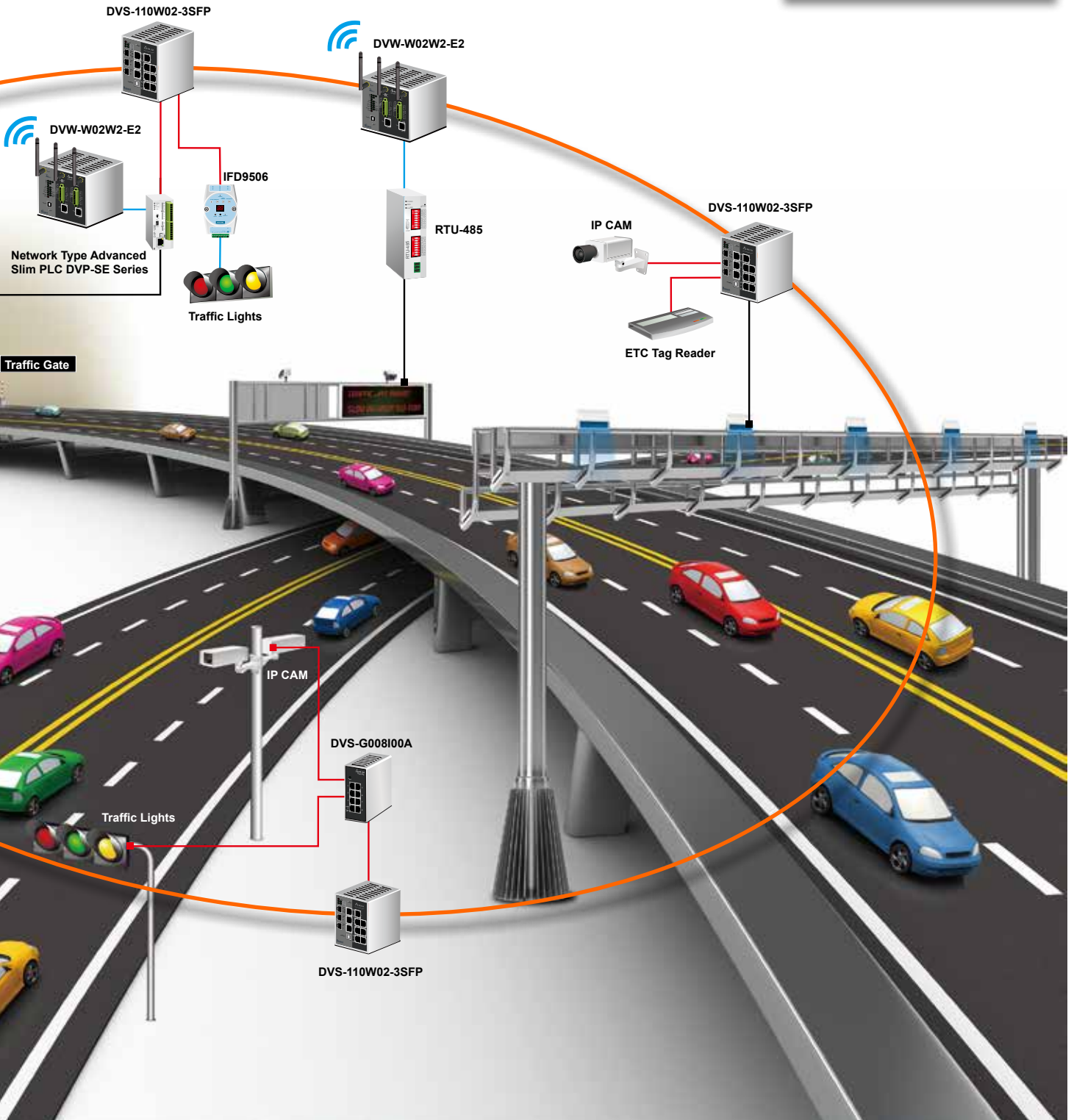
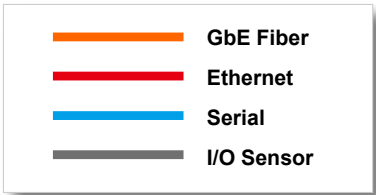


### IFD9506

#### 1-Port MODBUS-to-Ethernet Converter

- ▶ 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

#### Managed 10-Port 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

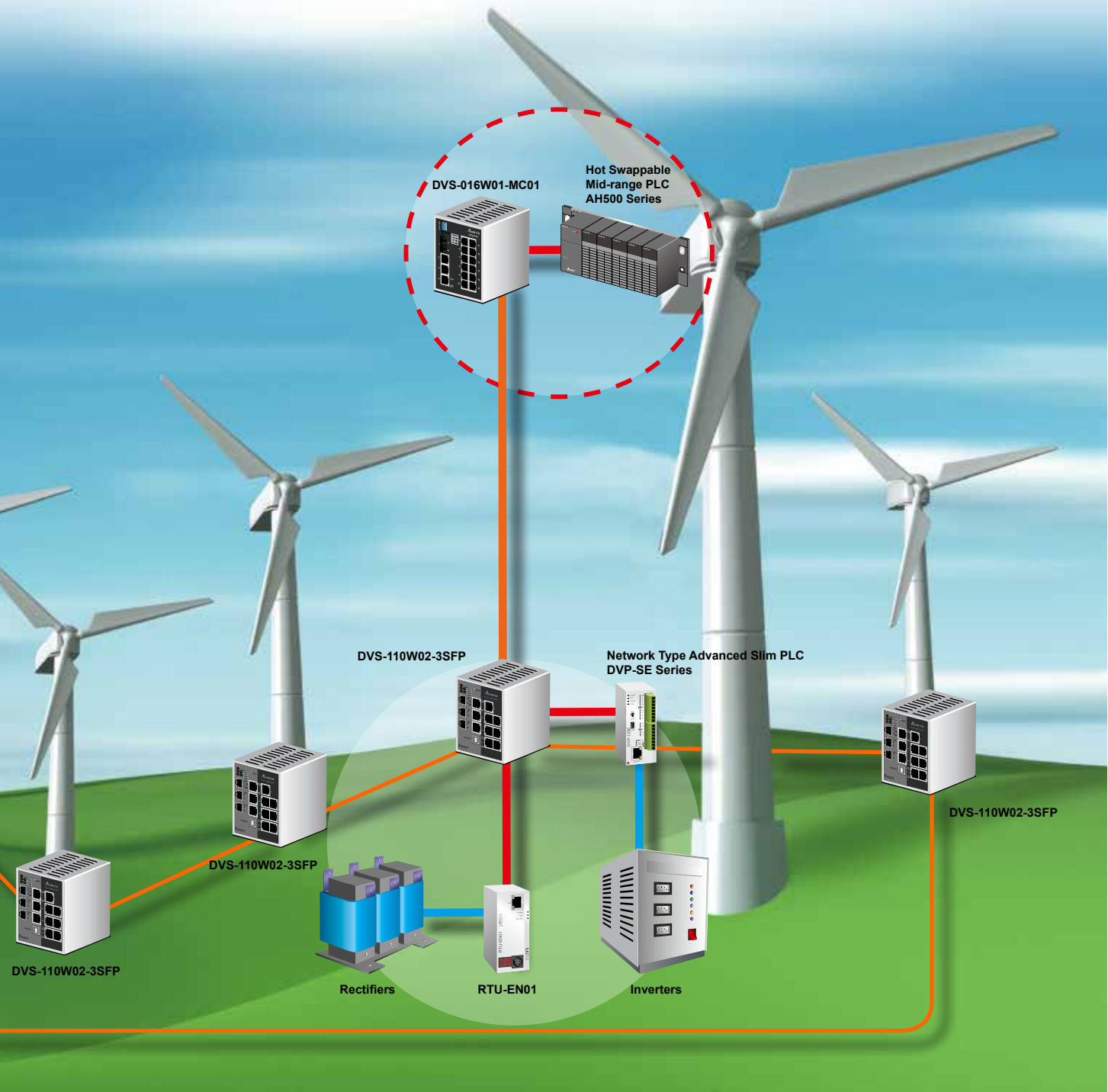
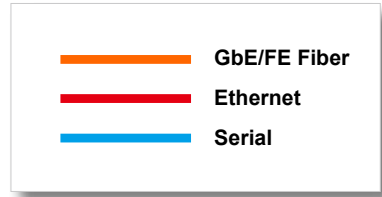


### DVS-016 Series

#### Unmanaged 16-Port FE 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

## DVW-W02W2-E2

### IEEE 802.11 a/b/g/n Wireless AP

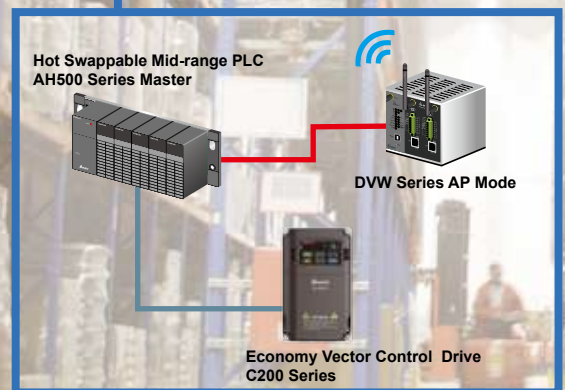
- ▶ IEEE 802.11n up to 450Mbps data rate
- ▶ Supports 2-port RS-232/422/485 to Ethernet Device Server
- ▶ IP40 metal case, -40 to 75°C operating temperature

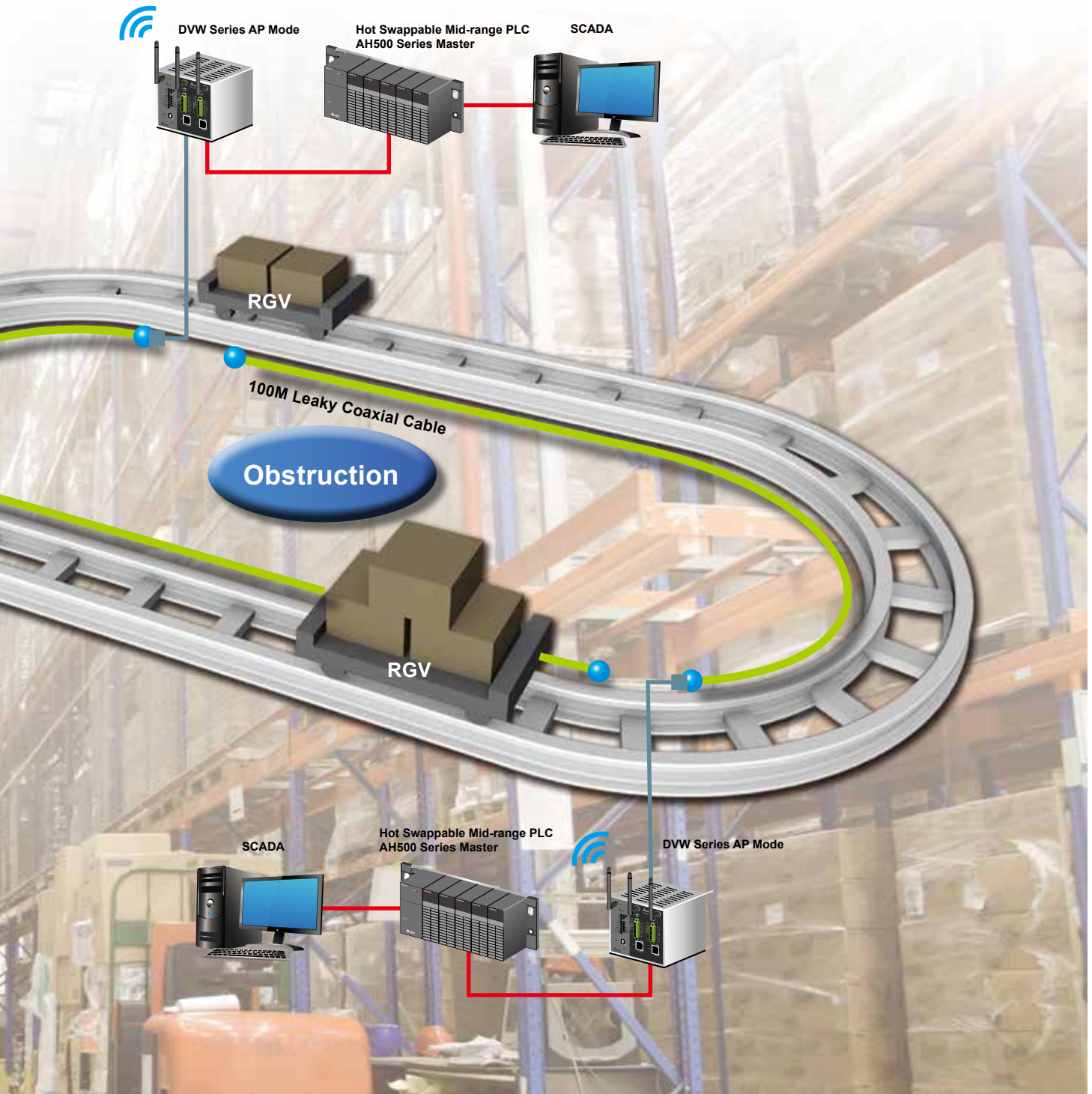
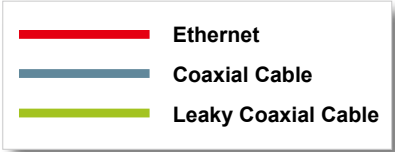


## AH500 Series

### Hot Swappable Mid-range PLC

- ▶ Utilizes 32-bit processor
- ▶ Max. I/O points:  
DIO: Max. 4,352 points  
AIO: Max. 544 channels  
RIO: >100,000 points
- ▶ Program capacity: Max. 384 k steps (1.5 MB)
- ▶ Data register (D+L): 256 k words
- ▶ Excellent program execution speed:  
LD instruction execution speed: 0.02 μs
- ▶ CPU built-in with fully isolated RS-232/422/485, Mini-USB, Ethernet and SDHC card slot





## Solar Power

Governments worldwide actively seek renewable clean energy for their electricity infrastructure in recent years. Solar power systems are one of the main programs. Most solar power plants are located in remote, vast areas of a country. The monitoring system constructed by Industrial Ethernet establishes highly stable and multiple redundant network systems for a power plant. It also facilitates real-time monitoring and continuous production by the highest generating capacity.

### DVS-108W02-2SFP

#### Managed 8-Port Ethernet Switch

- ▶ GbE fiber port to enhance backbone transmission
- ▶ ONE RING, ONE CHAIN for rapid network redundancy to ensure network reliability , recovery time less than 20ms
- ▶ IP40 metal case, -40°C to 75°C operating temperature



### DVS-G408W01

#### PoE+ Unmanaged 8-Port GbE Ethernet Switch

- ▶ 8 10/100/1000 Base-T PoE+ (PSE) ports. Based on IEEE 802.3at standard up to 30W per port
- ▶ Auto warning by relay output for power failure
- ▶ IP30 metal case, -40°C to 70°C operating temperature



### DX-2100RW

#### 3G Cloud Router

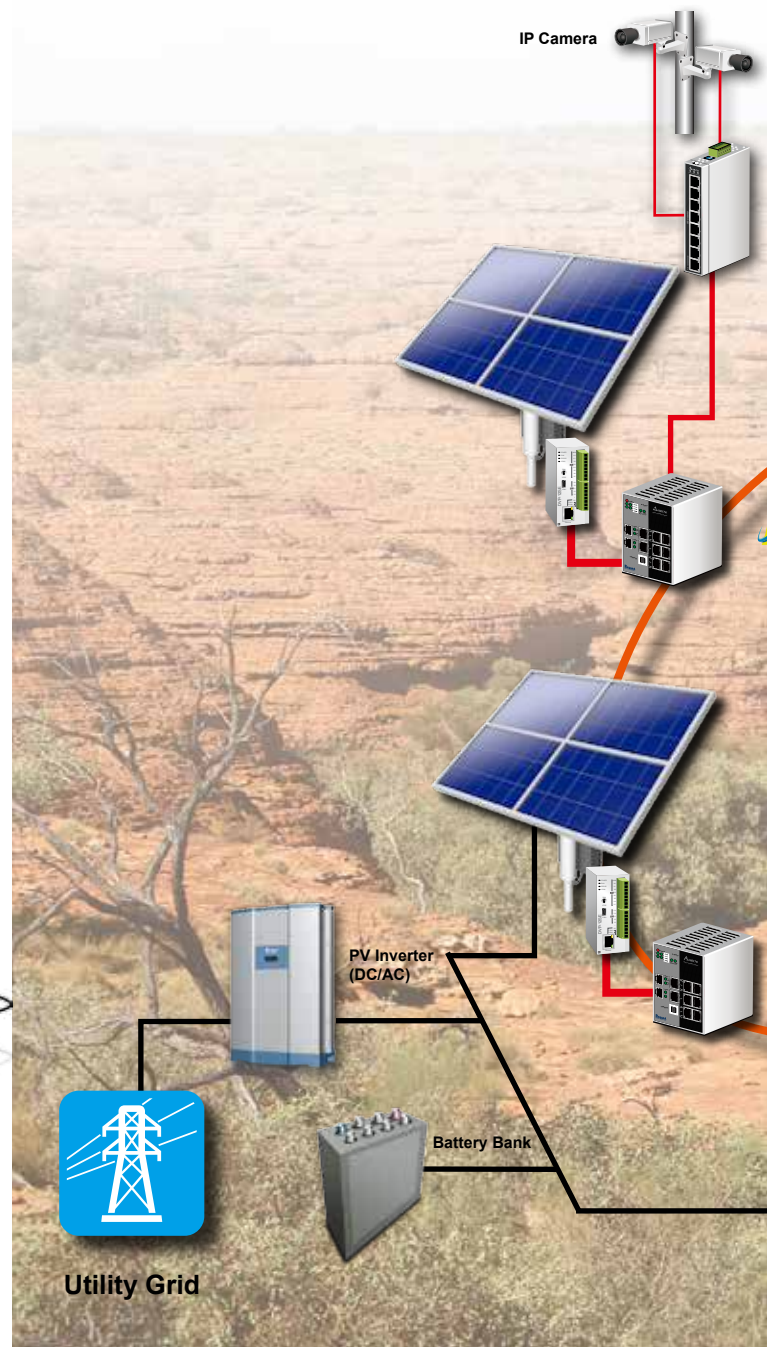
- ▶ UMTS / HSPA+ : 800/850 , 900, AWS1700, 1900, 2100 MHz
- ▶ Supports DIACloud Cloud Management Platform
- ▶ IP30 metal case, -20°C to 70°C operating temperature

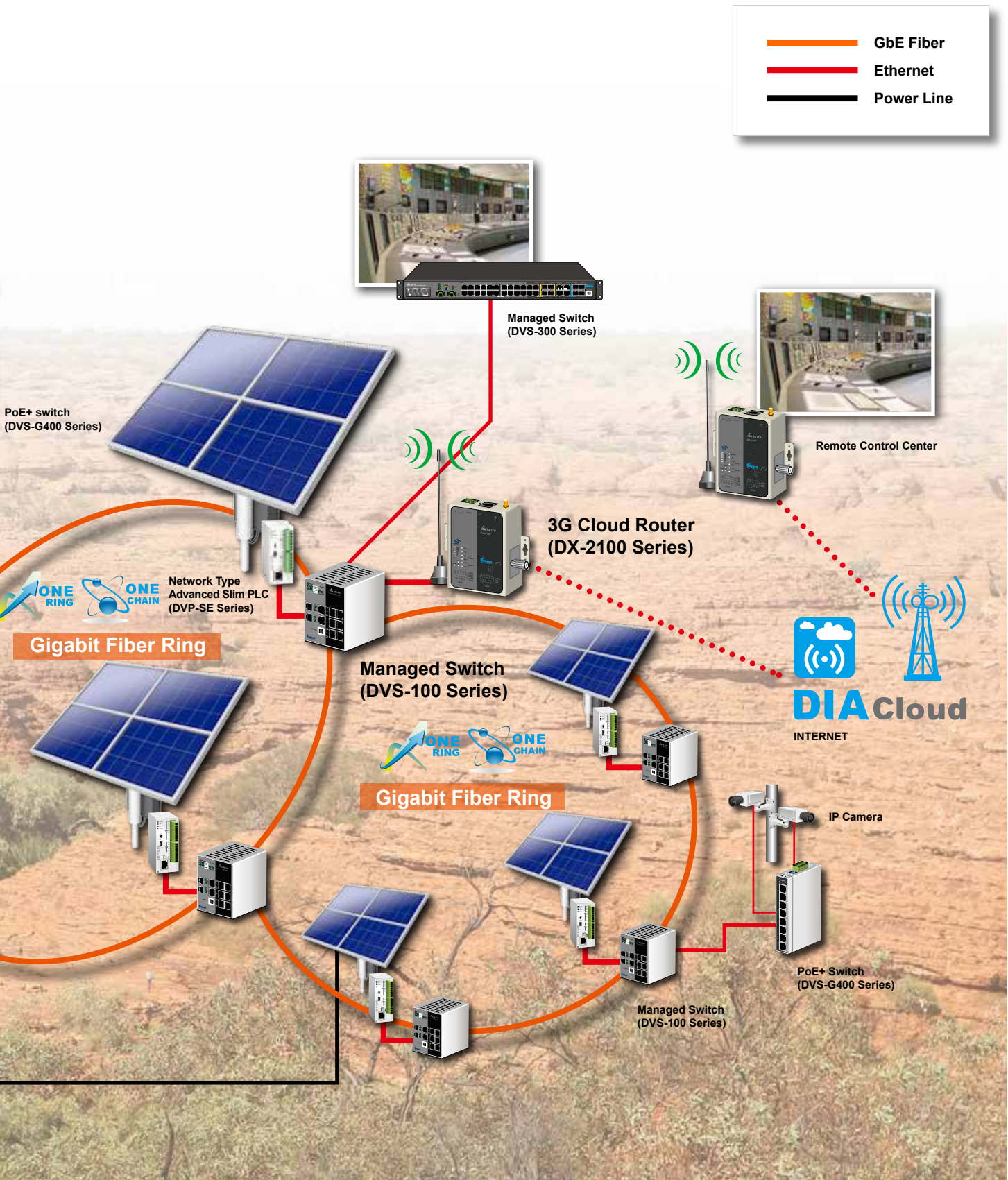


### DVP-SE

#### Network Type Advanced Slim PLC

- ▶ Specific Solar Tracking instruction
- ▶ Program capacity: 16K steps, Data register: 12K words; Higher execution speed, LD:0.64 μs, MOV:2 μs
- ▶ Built-in MODBUS TCP and Ethernet/IP





## Automated CNC Production Line

Unmanned factories is the ultimate goal for industrial automation. The logistics of an automated production line is an indispensable part of that goal. The use of robots, unmanned vehicles and other equipment, and data transmission and exchange via an industrial wireless network allows immediate acquisition of the status of the production line from the control room, and significantly increases the overall productivity and quality.

### DVW-W02W2-E2

#### IEEE 802.11 a/b/g/n Wireless AP

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



### DVS-008 Series

#### Unmanaged 8-Port FE 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



### AH500 Series

#### Hot Swappable Mid-range PLC

- ▶ Utilizes 32-bit processor
- ▶ Max. I/O points:  
DIO: Max. 4,352 points  
AIO: Max. 544 channels  
RIO: >100,000 points
- ▶ Program capacity: Max. 384k steps (1.5 MB)
- ▶ Data register (D+L): 256k words
- ▶ Excellent program execution speed:  
LD instruction execution speed: 0.02 μs
- ▶ CPU built-in with fully isolated RS-232 / 422 / 485, Mini-USB, Ethernet and SDHC card slot



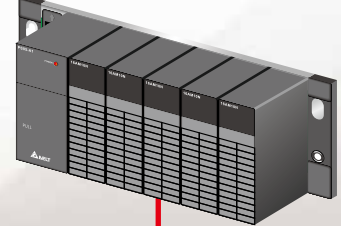
### DVP-SE Series

#### Advanced Slim PLC

- ▶ Remote I/O function is suitable for distributed sequence control
- ▶ Program capacity: 16k steps, Data register: 12k words; Higher execution speed, LD:0.64μs, MOV:2μs
- ▶ Built-in MODBUS TCP and EtherNet/IP

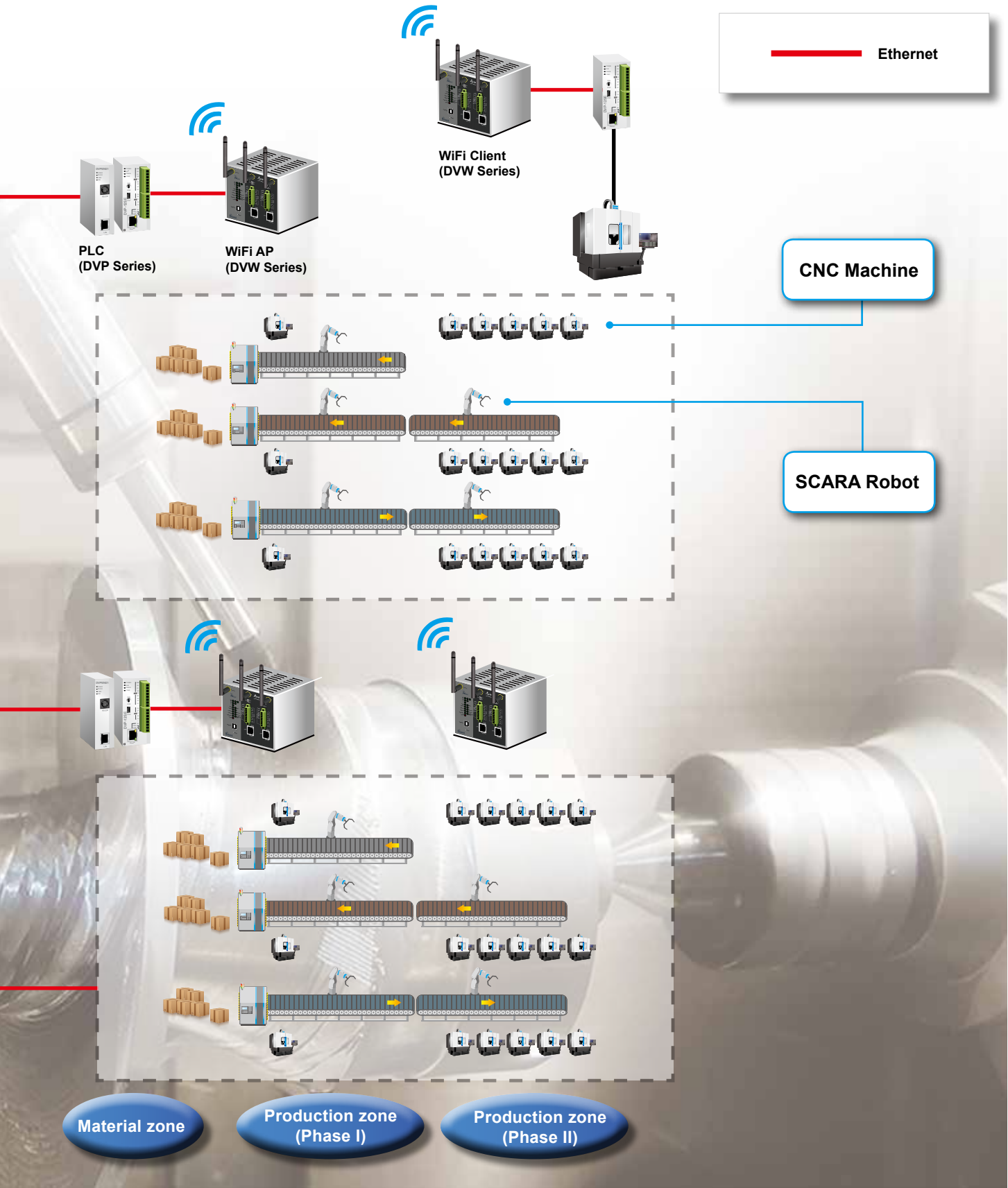


Hot Swappable Mid-range PLC (AH500 Series)



Unmanaged Switch (DVS-008 Series)





# Ethernet Switches

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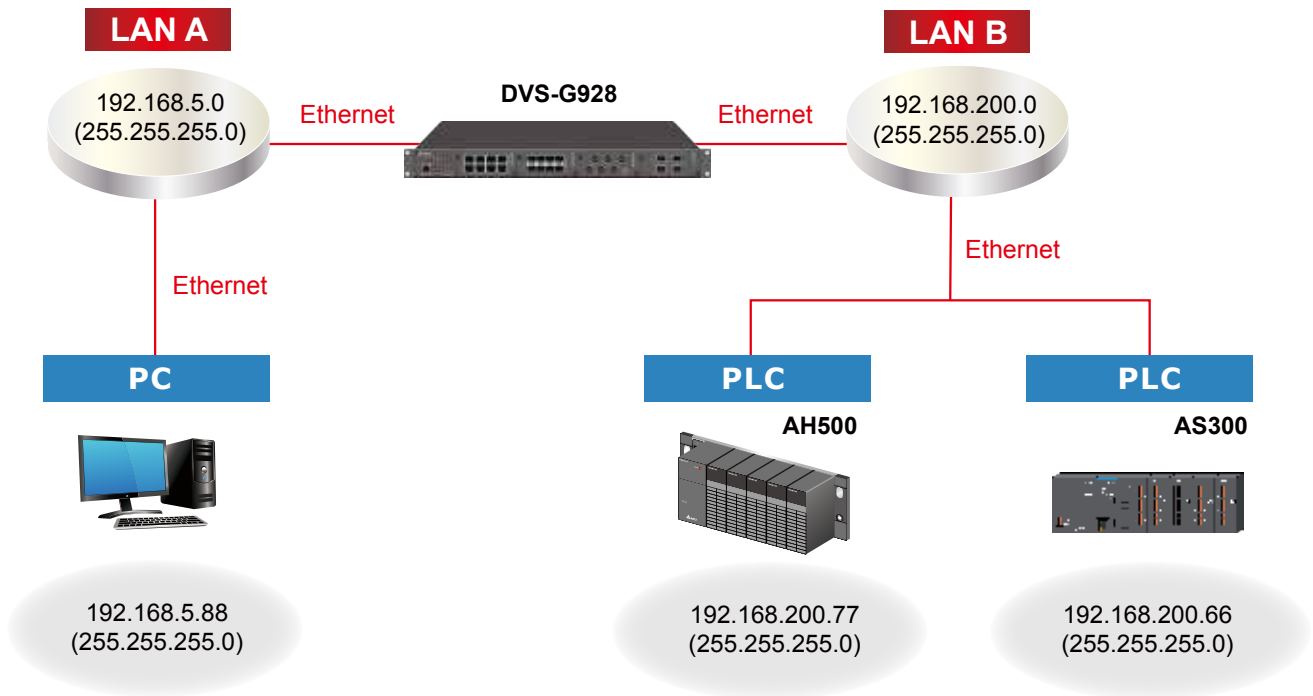
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# Feature-rich Layer 2+ /3 Network Management

## ▲ Powerful Layer 3 Routing Performance

The Layer 3 switches route and determine network paths to correctly transmit packets to the designated IP address for exchanging data between different subnets. Handling routing packets by hardware, Delta Layer 3 switches combine the latest technology in hardware and software engineering to adapt to rugged industrial environments. With fast-processing speed as an advantage, it can achieve network transmission that is as fast as or close to wired communicating speed.



## Network Redundancy Technology

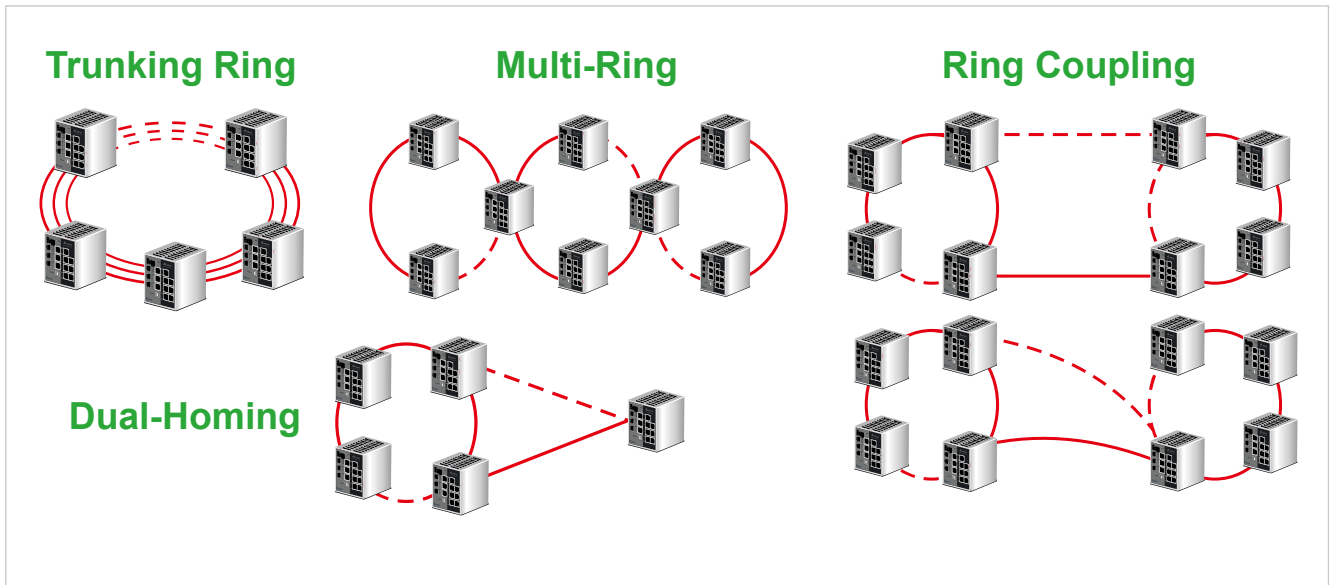
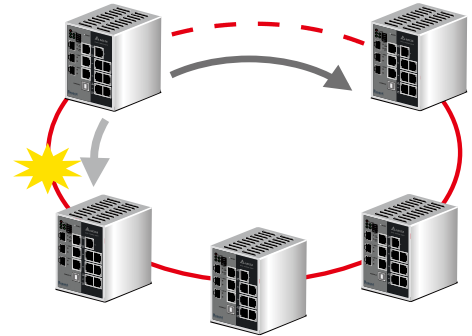
IEEE published the 802.1D Spanning Tree Protocol (STP) in 1998, and in 2004 announced 802.1w Rapid Spanning Tree Protocol (RSTP), which is an enhancement to STP. These network protocols are used to construct backup paths for transmission when a link fails and are applied in network structures with requirements 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 in seconds, becomes insufficient. Delta thoroughly understands customers' needs from different industries. To meet the high demand for speed and reliability, Delta has introduced ONE RING and ONE CHAIN ultra-speed redundant protocols to satisfy our customers' needs, by providing faster speed and more functions than STP and RSTP. With IIoT and Industry 4.0 becoming megatrend, Delta network redundancy technology continues to evolve and optimize all the time. ONE RING Plus and ONE CHAIN Plus provide a far higher level of performance than the previous generation ONE RING and ONE CHAIN. ONE RING Plus and ONE CHAIN Plus reduce double recovery time and bring excellent reliable and stable redundancy network.



# ONE RING Plus

## ▲ Network self-healing brings most recovery

Delta's proprietary self-healing redundant ring technology is called ONE RING Plus. ONE RING Plus can enable redundant paths and provide self-healing recovery time of less than 10 milliseconds to ensure fluent data transmission with minimum loss when any nodes fail or meet default in a ring network. In addition, ONE RING Plus 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 Plus provides highly flexible and highly reliable network structures, which greatly save on wiring cost.



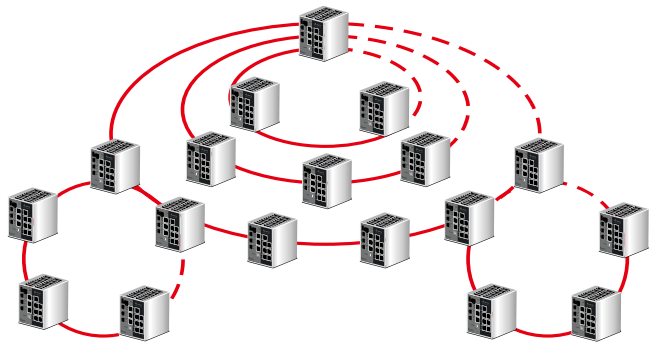
# ONE CHAIN Plus

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

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

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

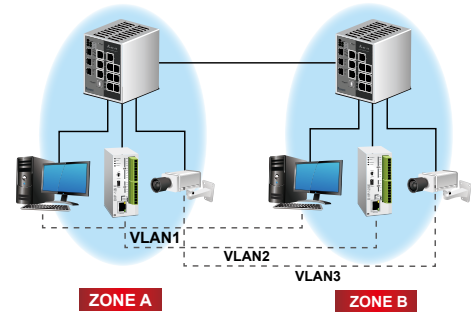
ONE CHAIN Plus is able to offer backup paths within 10 milliseconds when several network nodes fail at the same time to ensure fluent data transmission with minimum loss. Its high speed self-healing time is especially suitable for high-end automation network structures such as a Distributed Control System (DCS). ONE CHAIN Plus 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

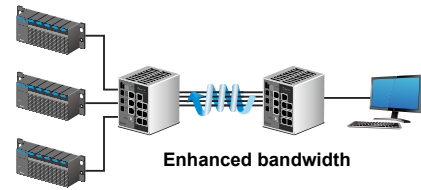
## VLAN

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.



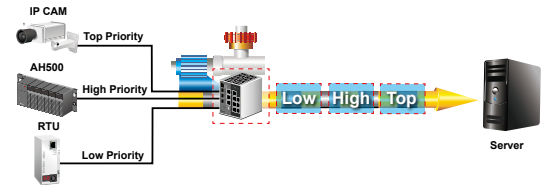
## Trunking

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



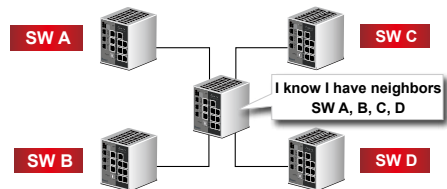
## Quality of Service (QoS)

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



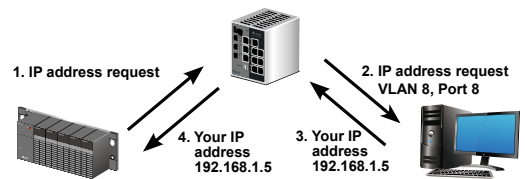
## Link Layer Discovery Protocol (LLDP)

The LLDP protocol is used by network devices for advertising their identity, capabilities, and any updates to neighboring devices on an IEEE 802.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

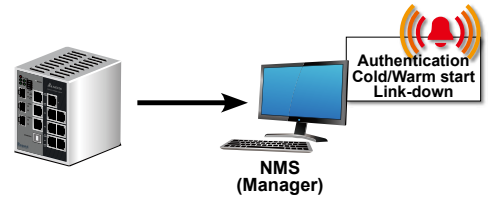
A complete set of security verification tools further ensures network security for users. Multiple protection mechanisms are incorporated in network management to protect it from unauthorized network access during operation.



## Advanced Network Management

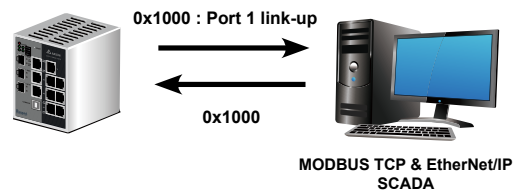
### Simple Network Management Protocol (SNMP)

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 & EtherNet/IP Manager

Delta Managed Ethernet Switches support MODBUS TCP and EtherNet/IP 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

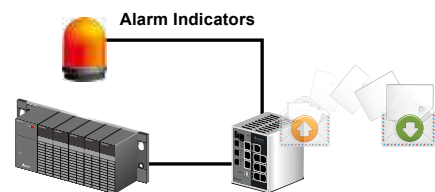
### Relay Output for Event Alarms

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.



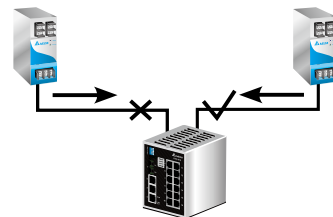
### Digital Inputs

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

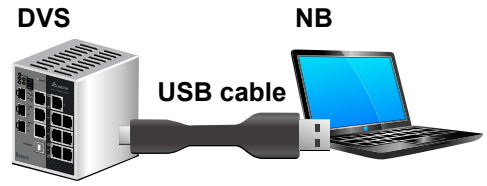
The design of dual power inputs provides excellent integration with the common dual power supply design of critical systems, or with industrial environments. It secures switches from potential power impact and provides highly-reliable and uninterrupted network transmission.



# 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.



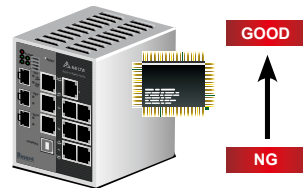
## ▲ SFP DDM

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.

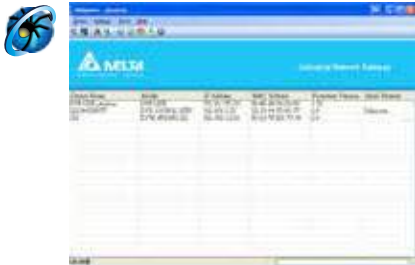


## ▲ Watch Dog Timer

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-G928 series

### Layer 3 Managed Industrial 28-Port GbE Modular Rack Mount Ethernet Switches



-40~85°C



EMC LEVEL 4



FANLESS

**Rugged**  
ETHERNET


- ▶ IPv6 address suitable for larger network and neighbor discovery
- ▶ Layer 3 routing function allows multiple subnets in a large network to exchange data and information across a network address
- ▶ Automatic IP assignment by DHCP server for easy network construction
- ▶ DHCP relay option 82 for sending DHCP requests with clients' identities to a DHCP server
- ▶ VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- ▶ Q-in-Q double VLAN to achieve multiple VLANs
- ▶ SNMP v1/v2c/v3 facilitates real-time remote management for network devices
- ▶ Supports EtherNet/IP and MODBUS TCP protocols that facilitates the remote management by SCADA and other industrial devices
- ▶ Proprietary redundancy RING and redundancy CHAIN high-end redundancy technology adopts easy-to-build multiple ring topology, with self-healing recovery time <30 ms to ensure reliable network transmission
- ▶ STP/RSTP/MSTP for network redundancy ensures reliability
- ▶ QoS(IEEE 802.1p) and TOS/DSCP for mission-critical applications
- ▶ IEEE 802.1Q VLAN and GVRP optimize network strategy
- ▶ Advanced DoS/DDoS auto prevention
- ▶ 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
- ▶ IEEE 1588v2 PTP (Precision Time Protocol) for precise time synchronization of network
- ▶ Broadcast/Multicast/ Unknown Unicast storm control to improve transmission quality
- ▶ Loopback-Detection to avoid broadcast storms by automatically shutting down the ports over a switching loop
- ▶ Cable diagnostic to auto-detect and report potential cabling issues
- ▶ Intelligent Access Control List (ACL)
- ▶ Each port adopts the MAC address locking function to block unauthorized access
- ▶ IGMP Snooping filters and manages multicast traffic
- ▶ RMON groups 1,2,3,9(history, statistics, alarms and events) for enhanced flow management and analysis
- ▶ Port mirroring for Many-to-One ports online troubleshooting
- ▶ Versatile system file updates by TFTP, HTTPS or HTTP
- ▶ DDM diagnosis function by SFP fiber modules
- ▶ Auto warning by email, relay, Syslog & SNMP trap
- ▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, CC-LINK IE and DNP 3.0

## Specifications

### 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 802.3ae 10 Gigabit
- 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 802.1AD VLAN Q-in-Q
- 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

### Gigabit Ethernet

#### RJ45 Ports

- auto MDI/MDI-X, auto negotiation

#### SFP Ports

- 100/1000Base-SFP

#### M12 Ports

- A-coded 8-pin female connector; auto MDI/MDI-X, auto negotiation

#### Console Port

- RS-232(RJ45 connector)

### Module Number

#### Module slots 1, 2 and 3:

- 8-Port 10/100/1000Base-T
- 8-Port 100/1000Base-SFP
- 6-Port 10/100/1000Base-T M12 modules

#### Module slot 4 :

- 4-Port 1000Base-SFP module

#### LEDs

#### Device:

- STATUS, PWR1, PWR2, R.M, RING, ALARM, RESET

#### Ports:

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

### Alarm Contacts (DO)

- 1 relay output (Normal open)
- 1 relay output (Normal close)
- Carry current 1A @ 24V<sub>DC</sub>

### Reset Button

- 1 set

## PERFORMANCE AND SCALABILITY

### Switching Capacity

- 128Gbps, Wired speed, Non-blocking switching fabric

### Forwarding Rate

- 41.7Mpps

### MAC Address Table

- 32K

### Packet Buffer Memory

- 32M bits

### Flash Memory

- 128M bits

### DRAM Size

- 1G bits

### IGMP Multicast Groups

- 128

### Max. VLANs

- 4096

### Quality of Service

- 8 priority queues per port

### DHCP Server

- 512 IP addresses

### Jumbo Frame

- 10K Bytes

## MANAGEMENT

### Layer 3 Routing

- RIP, VRRP v2/v3

### Software

- STP/RSTP/MSTP, LACP, QoS, IGMP Snooping v1/v2/v3, IGMP Query v1/v2, GVRP, VLAN, VLAN Q-in-Q, VLAN unaware, SSH, DNS, HTTP, HTTPS, RADIUS, TACACS+, SNMP v1/v2c/v3, SNMP Traps, TFTP, RMON, LLDP, DHCP Server/Client, DHCP Relay Option 82, 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 , RJ45 console, SNMP

### 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

- Installation: Rear cabling, industrial terminal block, redundant design
- 2 sets 100 to 240V<sub>AC</sub> / 125 to 370V<sub>DC</sub> (Tested @ 100 to 240V<sub>AC</sub>)

### Input Current

- Max. 1.3A

### Overload Current Protection

- Present, Max. input current 6.3A

### Reverse Polarity Protection

- Present (V<sub>DC</sub> input )

## PHYSICAL

### Housing

- IP30 metal case

### Dimensions

- 44 mm(H) x 440 mm(W) x 325 mm (D)

### Weight

- 6,600g

### Installation

- 19" Rack mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -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 61010, IEC 60950-1, CCC (DVS-G928W01-CN)

### EMI

- FCC 47 CFR Part 15 Subpart B Class A, EN 55022 (CISPR 22), EN 55032

### EMS (EN 55024)

- 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 61000-4-11

### Electrical Substation

- IEC 61850-3, IEEE 1613

### Rail Traffic

- EN 50121-4

### Environmental Type Tests

#### Shock:

- IEC 60068-2-27

#### Freefall:

- IEC 60068-2-32

#### Vibration:

- IEC 60068-2-6

#### Hi-Pot:

- 1.5KV

## Ordering Information

Product		Port Combination				Interface		
Model Name	Operating Temperature	Module Slot M1	Module Slot M2	Module Slot M3	Module Slot M4	DI	DO (Relay)	Power Input
DVS-G928W01	-40°C to 85°C	Select interface modules and SFP fiber transceivers				-	2	2
DVS-G928W01-CN	-40°C to 85°C	Select interface modules and SFP fiber transceivers				-	2	2

### DVS-G928 series interface module



Model Name	Operating Temperature	Module Slot				Interface			
		M1	M2	M3	M4	10/100/1000 Base-T RJ45	10/100/1000 Base-T M12	100/1000 Base-SFP	1000 Base-SFP
DVS-G900-8GE	-40°C to 85°C	√	√	√	-	8	-	-	-
DVS-G900-6GM12	-40°C to 85°C	√	√	√	-	-	6	-	-
DVS-G900-8GF	-40°C to 85°C	√	√	√	-	-	-	8	-
DVS-G900-4GF	-40°C to 85°C	-	-	-	√	-	-	-	4

### Optional Products

LCP Series: 100Base-FX/1000Base-X SFP Fiber Transceiver. See the LCP Series datasheets for product information.

## DVS-328 series

### Managed Industrial 20-Port FE + 4-Port FE combo 100Base-SFP + 4-Port GbE combo 100/1000Base-SFP Rack Mount Ethernet Switches



**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
- ▶ Q-in-Q double VLAN to distinguish multiple VLANs
- ▶ SNMP v1/v2c/v3 facilitates the exchange of management between network devices
- ▶ Supports EtherNet/IP and MODBUS TCP protocols that facilitates the remote management by SCADA and other industrial devices
- ▶ Proprietary ONE RING and ONE CHAIN high end redundancy technology, 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 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, CC-LINK IE and DNP 3.0

## Specifications

### 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 802.1AD VLAN Q-in-Q
- 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

- 20 10/100Base-T(X), auto MDI/MDI-X, auto negotiation

#### Fast Ethernet Combo Ports

##### RJ45 Ports:

- 4 10/100Base-T(X), auto MDI/MDI-X, auto negotiation

##### SFP Ports:

- 4 100Base-SFP

#### Gigabit Ethernet Combo Ports

##### RJ45 Ports:

- 4 10/100/1000Base-T, auto MDI/MDI-X, auto negotiation

##### SFP Ports:

- 4 100/1000Base-SFP

### Console Port

- RS-232 (USB B-Type connector)

### LEDs

#### Device:

- PWR1, PWR2, PWR3, R.M/CPLG.R, C.HD/C.TL, ALARM, DI

#### Ports:

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

### Digital Inputs(DI)

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

### Alarm Contacts(DO)

- 1 relay output
- Carry current 2A @ 24V<sub>DC</sub>

### Reset Button

- 1 set

## PERFORMANCE AND SCALABILITY

### Switching Capacity

- 12.8Gbps, Wired speed, Non-blocking switching fabric

### Forwarding Rate

- 19Mpps

### MAC Address Table

- 16K

### Packet Buffer Memory

- 1.5M bits

### IGMP Multicast Groups

- 256

### Max. VLANs

- 255

### Quality of Service

- 8 priority queues per port

### DHCP/BootP Server

- 1,275 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, VLAN Q-in-Q, VLAN unaware, 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, RARP, Telnet, Syslog, SMTP, SMTP Server/Client, IPv6, DoS/DDoS auto prevention, MODBUS TCP, EtherNet/IP

### Security

- MAC 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

- Installation: Front cabling. Industrial terminal block
- LV: 2 sets 36 to 72V<sub>DC</sub> (Tested @ 36 to 60V<sub>DC</sub>)
- HV: 1 set 85 to 264V<sub>AC</sub> / 88 to 370V<sub>DC</sub> (Tested @ 100 to 240V<sub>AC</sub>)

### Input Current

- LV: 0.75A
- HV: 1.2A

### Overload Current Protection

- Present, Max. Input current 8A

### Reverse Polarity Protection

- Present (V<sub>DC</sub> input)

### Voltage Dips Protection Time

- Min. 12ms at 48 V<sub>DC</sub>

## PHYSICAL

### Housing

- IP40 metal case

### Dimensions

- 44 mm(H) x 440 mm(W) x 257 mm (D)

### Weight

- 4,950g

### Installation

- 19" Rack mounting and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -40°C to 70°C (-40 °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 60950-1, IEC 60950-1, CCC

### EMI

- FCC 47 CFR Part 15 Subpart B Class A, IEC 61000-6-4, EN 55022 (CISPR 22), EN 55032

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

- IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11, 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	Combo Port 10/100Base-T(X) and 100Base-SFP	10/100 Base-T(X)	DI	DO (Relay)	Power Input
DVS-328R02-8SFP	-40°C to 70°C	4	4	20	1	1	3

### Optional Products

LCP Series: 100Base-FX/1000Base-X SFP Fiber Transceiver. See the LCP Series datasheets for product information.

CliQII/PMC Series: 48 V<sub>DC</sub> Industrial Power Supply

## DVS-G116 series

### Managed Industrial 12-Port GbE + 4-Port 100/1000Base-SFP Ethernet Switches



**Rugged**  
ETHERNET



UL61010



-40~75°C



EMC LEVEL 4



FANLESS

- ▶ 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
- ▶ Q-in-Q double VLAN to distinguish multiple VLANs
- ▶ SNMP v1/v2c/v3 facilitates the exchange of management between network devices
- ▶ Supports EtherNet/IP and MODBUS TCP protocols that facilitates the remote management by SCADA and other industrial devices
- ▶ Proprietary ONE RING Plus and ONE CHAIN Plus high end redundancy technology, easy to build multiple ring topology, self-healing recovery time < 10ms
- ▶ 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
- ▶ Port-isolated for special security environment
- ▶ 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
- ▶ Intelligent Access Control List (ACL)
- ▶ MAC addresses locking function per port blocks unauthorized access
- ▶ 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, CC-LINK IE and DNP 3.0

## Specifications

### 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 802.1AD VLAN Q-in-Q
- 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

### Gigabit Ethernet

#### RJ45 Ports:

- 12 10/100/1000Base-T, auto MDI/MDI-X, auto negotiation

#### SFP Ports:

- 4 100/1000Base-SFP

### Console Port

- RS-232 (Micro-USB connector)

### LEDs

#### Device:

- PWR1, PWR2, R.M/CPLG.R, C.HD/C.TL, ALARM, DI

#### Ports:

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

### Digital Inputs(DI)

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

### Alarm Contacts(DO)

- 1 relay output
- Carry current 1A @ 24V<sub>DC</sub>

### Reset Button

- 1 set

## PERFORMANCE AND SCALABILITY

### Switching Capacity

- 32Gbps, Wired speed, Non-blocking switching fabric

### Forwarding Rate

- 47.61Mpps

### MAC Address Table

- 8K

### Packet Buffer Memory

- 4M bits

### IGMP Multicast Groups

- 256

### Max. VLANs

- 255

### Quality of Service

- 4 priority queues per port

### DHCP/BootP Server

- 1,275 IP addresses

### Jumbo Frame

- 9,600 Bytes

## MANAGEMENT

### Software

- STP/RSTP/MSTP, LACP, QoS, IGMP Snooping v1/v2/v3, IGMP Query v1/v2, GARP, GMRP, VLAN, VLAN Q-in-Q, VLAN unaware, 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, RARP, Telnet, Syslog, SMTP, SMTP Server/Client, IPv6, MODBUS TCP, EtherNet/IP

### Security

- Port Security, 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 48V<sub>DC</sub> redundant terminal block input

### Input Current

- Max. 0.58A

### Overload Current Protection

- Present, Max. Input current 12A

### Reverse Polarity Protection

- Present

### Voltage Dips Protection Time

- Min. 10ms at 48 V<sub>DC</sub>

## PHYSICAL

### Housing

- IP40 metal case

### Dimensions

- 135 mm(H) x 65 mm(W) x 135 mm (D)

### Weight

- 1,100g

### 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 61010, IEC 62368-1

### EMI

- FCC 47 CFR Part 15 Subpart B Class A, IEC 61000-6-4, EN 55032 (CISPR 32)

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

- IEC 61000-4-2 level 4, IEC 61000-4-3 level 3, IEC 61000-4-4 level 4, IEC 61000-4-5 level 4, 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 60068-2-27

#### Freefall:

- ISTA-2A

#### 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	100/1000Base-SFP	10/100/1000 Base-T	DI	DO (Relay)	Power Input
DVS-G116W02-4GF	-40°C to 75°C	---	4	12	1	1	2

### Optional Products

LCP Series: 100Base-FX/1000Base-X SFP Fiber Transceiver. See the LCP Series datasheets for product information.

CliQII/PMC Series: 48 V<sub>DC</sub> Industrial Power Supply

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

# DVS-G112 series

## Managed Industrial 8-Port GbE + 4-Port 100/1000Base-SFP Ethernet Switches



**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
- ▶ Q-in-Q double VLAN to distinguish multiple VLANs
- ▶ SNMP v1/v2c/v3 facilitates the exchange of management between network devices
- ▶ Supports EtherNet/IP and MODBUS TCP protocols that facilitates the remote management by SCADA and other industrial devices
- ▶ Proprietary ONE RING Plus and ONE CHAIN Plus high end redundancy technology, easy to build multiple ring topology, self-healing recovery time < 10ms
- ▶ 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
- ▶ Port-isolated for special security environment
- ▶ 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
- ▶ Intelligent Access Control List (ACL)
- ▶ MAC addresses locking function per port blocks unauthorized access
- ▶ 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, CC-LINK IE and DNP 3.0

## Specifications

### 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 802.1AD VLAN Q-in-Q
- 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

### Gigabit Ethernet

#### RJ45 Ports:

- 8 10/100/1000Base-T, auto MDI/MDI-X, auto negotiation

#### SFP Ports:

- 4 100/1000Base-SFP

### Console Port

- RS-232 (Micro-USB connector)

### LEDs

#### Device:

- PWR1, PWR2, R.M/CPLG.R, C.HD/C.TL, ALARM, DI

#### Ports:

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

### Digital Inputs(DI)

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

### Alarm Contacts(DO)

- 1 relay output
- Carry current 1A @ 24V<sub>DC</sub>

### Reset Button

- 1 set

## PERFORMANCE AND SCALABILITY

### Switching Capacity

- 24Gbps, Wired speed, Non-blocking switching fabric

### Forwarding Rate

- 35.71Mpps

### MAC Address Table

- 8K

### Packet Buffer Memory

- 4M bits

### IGMP Multicast Groups

- 256

### Max. VLANs

- 255

### Quality of Service

- 4 priority queues per port

### DHCP/BootP Server

- 1,275 IP addresses

### Jumbo Frame

- 9,600 Bytes

## MANAGEMENT

### Software

- STP/RSTP/MSTP, LACP, QoS, IGMP Snooping v1/v2/v3, IGMP Query v1/v2, GARP, GMRP, VLAN, VLAN Q-in-Q, VLAN unaware, 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, RARP, Telnet, Syslog, SMTP, SMTP Server/Client, IPv6, MODBUS TCP, EtherNet/IP

### Security

- Port Security, 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 48V<sub>DC</sub> redundant terminal block input

### Input Current

- Max. 0.58A

### Overload Current Protection

- Present, Max. Input current 12A

### Reverse Polarity Protection

- Present

### Voltage Dips Protection Time

- Min. 10ms at 48 V<sub>DC</sub>

## PHYSICAL

### Housing

- IP40 metal case

### Dimensions

- 135 mm(H) x 51 mm(W) x 135 mm (D)

### Weight

- 1,080g

### 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 61010, IEC 62368-1

### EMI

- FCC 47 CFR Part 15 Subpart B Class A, IEC 61000-6-4, EN 55032 (CISPR 32)

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

- IEC 61000-4-2 level 4, IEC 61000-4-3 level 3, IEC 61000-4-4 level 4, IEC 61000-4-5 level 4, 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 60068-2-27

#### Freefall:

- ISTA-2A

#### 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	100/1000Base-SFP	10/100/1000 Base-T	DI	DO (Relay)	Power Input
DVS-G112W02-4GF	-40°C to 75°C	---	4	8	1	1	2

### Optional Products

LCP Series: 100Base-FX/1000Base-X SFP Fiber Transceiver. See the LCP Series datasheets for product information.

CliQII/PMC Series: 48 V<sub>DC</sub> Industrial Power Supply

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

## DVS-G106 series

### Managed Industrial 4-Port GbE + 2-Port 100/1000Base-SFP Ethernet Switches



**Rugged**  
ETHERNET



UL61010



-40~75°C



EMC LEVEL 4



FANLESS

- ▶ 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
- ▶ Q-in-Q double VLAN to distinguish multiple VLANs
- ▶ SNMP v1/v2c/v3 facilitates the exchange of management between network devices
- ▶ Supports EtherNet/IP and MODBUS TCP protocols that facilitates the remote management by SCADA and other industrial devices
- ▶ Proprietary ONE RING Plus and ONE CHAIN Plus high end redundancy technology, easy to build multiple ring topology, self-healing recovery time < 10ms
- ▶ 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
- ▶ Port-isolated for special security environment
- ▶ 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
- ▶ Intelligent Access Control List (ACL)
- ▶ MAC addresses locking function per port blocks unauthorized access
- ▶ 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, CC-LINK IE and DNP 3.0

## Specifications

### 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 802.1AD VLAN Q-in-Q
- 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

### Gigabit Ethernet

#### RJ45 Ports:

- 4 10/100/1000Base-T, auto MDI/MDI-X, auto negotiation

#### SFP Ports:

- 2 100/1000Base-SFP

### Console Port

- RS-232 (Micro-USB connector)

### LEDs

#### Device:

- PWR1, PWR2, R.M/CPLG.R, C.HD/C.TL, ALARM, DI

#### Ports:

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

### Digital Inputs(DI)

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

### Alarm Contacts(DO)

- 1 relay output
- Carry current 1A @ 24V<sub>DC</sub>

### Reset Button

- 1 set

## PERFORMANCE AND SCALABILITY

### Switching Capacity

- 24Gbps, Wired speed, Non-blocking switching fabric

### Forwarding Rate

- 35.71Mpps

### MAC Address Table

- 8K

### Packet Buffer Memory

- 4M bits

### IGMP Multicast Groups

- 256

### Max. VLANs

- 255

### Quality of Service

- 4 priority queues per port

### DHCP/BootP Server

- 1,275 IP addresses

### Jumbo Frame

- 9,600 Bytes

## MANAGEMENT

### Software

- STP/RSTP/MSTP, LACP, QoS, IGMP Snooping v1/v2/v3, IGMP Query v1/v2, GARP, GMRP, VLAN, VLAN Q-in-Q, VLAN unaware, 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, RARP, Telnet, Syslog, SMTP, SMTP Server/Client, IPv6, MODBUS TCP, EtherNet/IP

### Security

- Port Security, 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 48V<sub>DC</sub> redundant terminal block input

### Input Current

- Max. 0.58A

### Overload Current Protection

- Present, Max. Input current 12A

### Reverse Polarity Protection

- Present

### Voltage Dips Protection Time

- Min. 10ms at 48 V<sub>DC</sub>

## PHYSICAL

### Housing

- IP40 metal case

### Dimensions

- 135 mm(H) x 51 mm(W) x 135 mm (D)

### Weight

- 1,020g

### 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 61010, IEC 62368-1

### EMI

- FCC 47 CFR Part 15 Subpart B Class A, IEC 61000-6-4, EN 55032 (CISPR 32)

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

- IEC 61000-4-2 level 4, IEC 61000-4-3 level 3, IEC 61000-4-4 level 4, IEC 61000-4-5 level 4, 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 60068-2-27

#### Freefall:

- ISTA-2A

#### 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	100/1000Base-SFP	10/100/1000 Base-T	DI	DO (Relay)	Power Input
DVS-G106W02-2GF	-40°C to 75°C	---	2	4	1	1	2

### Optional Products

LCP Series: 100Base-FX/1000Base-X SFP Fiber Transceiver. See the LCP Series datasheets for product information.

CliQII/PMC Series: 48 V<sub>DC</sub> Industrial Power Supply

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

## 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 technology, 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, CC-LINK IE and DNP 3.0

## Specifications

### 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

- RS-232 (USB B-Type connector)

### LEDs

#### Device:

- ALARM, PWR1, PWR2, DI1, DI2, R.M/CPLG.R, C.HD/C.TL

#### 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 @ 24V<sub>DC</sub>

### 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 V<sub>DC</sub> redundant terminal block input

### Input Current

- Max. 0.95A

### Overload Current Protection

- Present, max. input current 3A

### Reverse Polarity Protection

- Present

### Voltage Dips Protection Time

- Min. 12ms at 24V<sub>DC</sub>

## 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-FX/1000Base-X SFP Fiber Transceiver. See the LCP Series datasheets for product information.

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48V<sub>DC</sub> Industrial Power Supply

## DVS-109 series

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



**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 technology, 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, CC-LINK IE and DNP 3.0

\*Please check DELTA website for the latest firmware version

## Specifications

### 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

#### RJ45 Ports:

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

### Console Port

- RS-232 (USB B-Type connector)

### LEDs

#### Device:

- ALARM, PWR1, PWR2, DI, R.M/CPLG.R, C.HD/C.TL

#### 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@24V<sub>DC</sub>

### 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 48V<sub>DC</sub> redundant terminal block input

### Input Current

- Max. 0.58A

### Overload Current Protection

- Present, max. Input current 3A

### Reverse Polarity Protection

- Present

### Voltage Dips Protection Time

- Min. 12ms at 24V<sub>DC</sub>

## 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

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48V<sub>DC</sub> 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, CC-LINK IE and DNP 3.0

\*Please check DELTA website for the latest firmware version

## Specifications

### 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

- RS-232 (USB B-Type connector)

### LEDs

#### Device:

- ALARM, PWR1, PWR2, DI1, DI2, R.M/CPLG.R, C.HD/C.TL

#### 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@24V<sub>DC</sub>

### 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 V<sub>DC</sub> redundant terminal block input

### Input Current

- Max. 0.87A

### Overload Current Protection

- Present, max. input current 3A

### Reverse Polarity Protection

- Present

### Voltage Dips Protection Time

- Min. 12ms at 24V<sub>DC</sub>

## 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-FX/1000Base-X SFP Fiber Transceiver. See the LCP Series datasheets for product information.

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48V<sub>DC</sub> Industrial Power Supply

# DVS-103I02C-DLR

## EtherNet/IP DLR Industrial 3-Port FE Ethernet Switches



UL61010



FANLESS

- ▶ EtherNet/IP protocol supported
- ▶ Support DLR (device-level ring) technology, self-healing recovery time < 3ms (less than 50-node)
- ▶ Design with DI and DO to automate alarms
- ▶ 12 to 48 V<sub>DC</sub> redundant terminal block power input
- ▶ -20°C to 70°C operating temperature

## Specifications

### TECHNOLOGY

#### Standard Compliance

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

#### Processing Type

- Store and Forward

### INTERFACE

#### Fast Ethernet

##### RJ45 Ports:

- 3 10/100Base-T(X), auto MDI/MDI-X, auto negotiation

#### LEDs

##### Per Device:

- PWR1/PWR2, DLR, DI, ALARM

##### Per Port:

- LINK, ACT

#### DIP Switches

- Configuration for DHCP/BootP, Factory Default, DLR Enable/Disable

#### 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@24V<sub>DC</sub>

### MANAGEMENT

#### Software

- EtherNet/IP, IGMP Snooping v1/v2, VLAN, DHCP/BootP Client

#### DLR Mode

- Supervisor, Ring

#### Configuration

- Delta EIP Builder, EtherNet/IP EDS(Electronic Data Sheet) file
- #### Firmware Upgrade
- Web Browser

## POWER REQUIREMENTS

### Input Voltage

- 2 sets, 12 to 48V<sub>DC</sub> redundant terminal block input

### Input Current

- Max. 0.31A

### Overload Current Protection

- Present, max. Input current 0.9A

### Reverse Polarity Protection

- Present

## PHYSICAL

### Housing

- IP40 PC plastic

### Dimensions

- 110 mm (H) x 28 mm (W) x 75 mm (D)

### Weight

- 126g

### Installation

- Industrial DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -20°C to 70°C (-4°F to 158°F)

### Storage Temperature

- -20°C to 70°C (-4°F to 158°F)

### Ambient Relative Humidity

- 5% to 95% (non-condensing)

## APPROVALS

### Safety

- UL 61010, IEC 62368-1

### EMI

- FCC 47 CFR Part 15 Subpart B Class A, EN 55032, AS/NZS CISPR 32

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

- 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 3, IEC 61000-4-8 level 4, IEC 61000-4-17

### Environmental Type Tests

#### Cold Temperature:

- IEC 60068-2-1

#### Dry Heat:

- IEC 60068-2-2

#### Humidity:

- IEC 60068-2-30

#### Shock:

- IEC 60068-2-27

#### Freefall:

- IEC 60068-2-32

#### Vibration:

- IEC 60068-2-6

#### Hi-Pot:

- 500KV

## Ordering Information

Product		Port Combination	Interface		
Model Name	Operating Temperature	10/100Base-T(X)	DI	DO (Relay)	Power Input
DVS-103I02C-DLR	-20°C to 70°C	3	2	2	2

### Optional Products

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48V<sub>DC</sub> Industrial Power Supply

# DVS-G005I00A Series

## Unmanaged Industrial 5-Port GbE Ethernet Switches



- ▶ 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 9,216 Bytes
- ▶ EEE Green Ethernet for power savings
- ▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, CC-LINK IE and DNP 3.0



## Specifications

### TECHNOLOGY

#### Standard Compliance

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

#### Forwarding Rate

##### DVS-G005I00A:

- 7.44Mpps

#### MAC Address Table

##### DVS-G005I00A:

- 2K

#### Packet Buffer Memory

##### DVS-G005I00A:

- 1M 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 V<sub>DC</sub> terminal block input

### Input Current

- Max. 0.18A

### Overload Current Protection

- Present, max. input current 3A

### Reverse Polarity Protection

- Present

### Voltage Dips Protection Time

- Min. 13ms at 24V<sub>DC</sub>

## 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-G005I00A	-10°C to 60°C	---	5	---	---	---	1

### Optional Products

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48V<sub>DC</sub> 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 V<sub>DC</sub> 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, CC-LINK IE and DNP 3.0

## Specifications

### 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@24V<sub>DC</sub>

### 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 V<sub>DC</sub> redundant terminal block input

#### Input Current

- Max. 0.6A

#### Overload Current Protection

- Present, max. input current 3A

#### Reverse Polarity Protection

- Present

#### Voltage Dips Protection Time

- Min. 13ms at 24V<sub>DC</sub>

### 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/CiQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

CiQII/PMC Series: 48V<sub>DC</sub> 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 V<sub>DC</sub> 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, CC-LINK IE and DNP 3.0

## Specifications

### 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@24V<sub>DC</sub>

### 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 V<sub>DC</sub> redundant terminal block input

##### DVS-008100:

- 1 set, 12 to 48 V<sub>DC</sub> terminal block input

#### Input Current

##### DVS-008W series:

- Max. 0.45A

##### DVS-008100:

- Max. 0.18A

#### Overload Current Protection

- Present, max. input current 3A

#### Reverse Polarity Protection

- Present

#### Voltage Dips Protection Time

##### DVS-008W series:

- Min. 13ms at 24V<sub>DC</sub>

##### DVS-0081:

- Min. 10ms at 24V<sub>DC</sub>

## PHYSICAL

### Housing

- IP40 metal case

### Dimensions

#### DVS-008W series:

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

#### DVS-008I00:

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

### Weight

#### DVS-008W series:

- 430g

#### DVS-008I00:

- 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-008I00:

- -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-008I00	-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 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48V<sub>DC</sub> Industrial Power Supply

# DVS-005 Series

## Unmanaged Industrial 5-Port FE Ethernet Switches



- ▶ 12 to 48 V<sub>DC</sub> 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, CC-LINK IE, and DNP 3.0



## Specifications

### 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@24V<sub>DC</sub>

### 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 V<sub>DC</sub> redundant terminal block power input

##### DVS-005100:

- 1 set, 12 to 48 V<sub>DC</sub> terminal block input

#### Input Current

- Max. 0.24A

#### Overload Current Protection

- Present, max. input current 3A

#### Reverse Polarity Protection

- Present

#### Voltage Dips Protection Time

- Min. 13ms at 24V<sub>DC</sub>

### 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 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48V<sub>DC</sub> Industrial Power Supply

## DVS-G005I00C Series

### Unmanaged Industrial 5-Port GbE Ethernet Switches



- ▶ 12 to 48 V<sub>DC</sub> redundant terminal block power input
- ▶ Jumbo frame size up to 10K Bytes
- ▶ -20°C to 70°C operating temperature
- ▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, CC-LINK IE, and DNP 3.0

## Specifications

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X)
- IEEE 802.3ab 1000Base-T
- 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

#### Gigabit Ethernet

##### RJ45 Ports:

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

#### LEDs

##### Per Device:

- PWR1, PWR2

##### Per Port:

- 10/100/1000M, LINK/ACT

### PERFORMANCE AND SCALABILITY

#### Switching Capacity

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

#### Forwarding Rate

- 7.44Mpps

#### MAC Address Table

- 8K

#### Packet Buffer Memory

- 1M bits

#### Jumbo Frame

- 10K Bytes

### POWER REQUIREMENTS

#### Input Voltage

- 2 sets, 12 to 48 V<sub>DC</sub> redundant terminal block input

#### Input Current

- Max. 0.3A

#### Overload Current Protection

- Present, max. input current 0.5A

#### Reverse Polarity Protection

- Present

### PHYSICAL

#### Housing

- IP40 PC plastic

#### Dimensions

- 110mm (H) x 28mm (W) x 75mm (D)

#### Weight

- 125g

#### Installation

- Industrial DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -20°C to 70°C (-4°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 61010, IEC 62368-1

### EMI

- FCC 47 CFR Part 15 Subpart B Class A, IEC61000-6-4, EN 55032, AS/NZS CISPR 32

### EMS [IEC61000-6-2, EN 55024]

- 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 3, IEC 61000-4-8 level 4, IEC 61000-4-17

### 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:

- 500V

## 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-G005I00C	-20°C to 70°C	---	5	---	---	---	2

### Optional Products

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48V<sub>DC</sub> Industrial Power Supply

# DVS-008W00-M12 Series

## Unmanaged Industrial 8-Port FE M12 IP67 Ethernet Switches



- ▶ Strong 5g resistance designs with M12 connectors for extreme vibration environment
- ▶ IP67-rated waterproof and dustproof metal housing to prevent penetrating water and micro dust ingress
- ▶ Transparent transmission of VLAN tagged packets
- ▶ 12 to 48 V<sub>DC</sub> redundant power input
- ▶ -40°C to 75°C wide operating temperature
- ▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, CC-LINK IE, and DNP 3.0



## Specifications

### TECHNOLOGY

#### Standard Compliance

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

##### M12 Ports:

- D-coded 4-pin female connector, 10/100Base-T(X), auto MDI/MDI-X, auto negotiation

#### LEDs

##### Per Device:

- PWR1, PWR2

##### Per Port:

- LINK/ACT

### PERFORMANCE AND SCALABILITY

#### Switching Capacity

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

#### Forwarding Rate

- 2.38Mpps

#### MAC Address Table

- 2K

#### Packet Buffer Memory

- 448K bits

#### Transparent Forwarding VLAN Tagged Packets

- Default enabled

### POWER REQUIREMENTS

#### M12 Port

- 1 A-coded 4-pin male connector

#### Input Voltage

- 2 sets, 12 to 48 V<sub>DC</sub> redundant input

#### Input Current

- Max. 0.156A

#### Overload Current Protection

- Present, max. input current 3A

#### Reverse Polarity Protection

- Present

### PHYSICAL

#### Housing

- IP67 metal case

#### Dimensions

- 194mm (H) x 62mm (W) x 25mm (D)

#### Weight

- 355g

#### 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 61010, EN 62368-1

### EMI

- FCC 47 CFR Part 15 Subpart B Class A, IEC 61000-6-4, EN 55032, EN55011, AS/NZS CISPR 32

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

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

### Environmental Type Tests

#### Cold Temperature:

- IEC 60068-2-1

#### Dry Heat:

- IEC 60068-2-2

#### Humidity:

- IEC 60068-2-30

#### Shock:

- IEC 60068-2-27

#### 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/ 1000Base-T	10/ 100Base-T(X)	DI	DO (Relay)	Power Input
DVS-008W00-M12	-40°C to 75°C	---	---	8	---	---	2

### Optional Products

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48V<sub>DC</sub> Industrial Power Supply

## DVS-G512W01-4GF Series

### IEEE 802.3 af/at PoE+ Managed Industrial 8-Port GbE (PSE) + 4-Port 100/1000Base-SFP Ethernet Switches



-40~70°C

EMC  
LEVEL 3

FANLESS

**Rugged**  
ETHERNET


- ▶ Based on IEEE 802.3at standard up to 30Watts per port.  
Backwardcompatible with IEEE 802.3af
- ▶ Advanced PoE management and intelligent powered device (PD) class detection
- ▶ IPv6 address suitable for larger network and neighbor discovery
- ▶ Automatic IP assignment by DHCP 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 real-time remote management of network devices
- ▶ Proprietary redundancy RING and redundancy CHAIN high end redundancy technologies, for multiple ring topology. Self-healing recovery time < 30ms
- ▶ IEC 62439-2 MRP (media redundancy protocol) for IEC-based redundant ring topology
- ▶ STP/RSTP/MSTP for network redundancy further ensures reliability
- ▶ QoS (IEEE 802.1p) and TOS/DSCP for mission-critical applications
- ▶ IEEE 802.1Q VLAN, Q-in-Q double 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
- ▶ IEEE 1588v2 PTP (Precision Time Protocol) for precise time synchronization of network
- ▶ Broadcast/multicast/unknown unicast 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 filtering function per port blocks unauthorized access
- ▶ IGMP snooping prunes multicast traffic
- ▶ Port mirroring for Many-to-One ports online troubleshooting
- ▶ DDM snooping function by SFP fiber module
- ▶ Auto warning by email, relay, Syslog & SNMP trap
- ▶ Compatible with various industrial protocols, including EtherNet/IP, Profinet, CC-LINK IE and DNP 3.0

## Specifications

### 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

## TECHNOLOGY

### Standard Compliance

- IEEE 802.1X Port Authentication
- IEEE 802.3ad LACP Aggregation
- IEEE 802.1AB Link Layer Discovery Protocol
- IEEE 1588v2 Clock Synchronization
- IEEE 802.3af PoE 15.4 Watts
- IEEE 802.3at PoE 30 Watts

### 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:

- 8 10/100/1000Base-T, auto MDI/MDI-X, auto negotiation

#### SFP Ports:

- 4 100/1000Base-SFP

#### PoE+ Pinout:

- 1 & 2 DC +, 3 & 6 DC -

#### Console Port:

- RS-232 (RJ45 connector)

### LEDs

#### Device:

- STATUS, PWR1, PWR2, R.M, RING, ALARM

#### Ports:

- 100/1000M (SFP port), 10/100/1000M (RJ45 port), PoE+

### Alarm Contacts(DO)

- 1 relay output
- Carry current 1 A@24V<sub>DC</sub>

### Reset Button

- 1 set

## PERFORMANCE AND SCALABILITY

### Switching Capacity

- 24Gbps, Wired speed, Non-blocking switching fabric

### Forwarding Rate

- 35.7Mpps

### MAC Address Table

- 8K

### Packet Buffer Memory

- 4M bits

### IGMP Multicast Groups

- 256

### Max. VLANs

- 4096

### Quality of Service

- 8 priority queues per port

### DHCP Server

- 253 IP addresses

### Jumbo Frame

- 9,216 Bytes

## MANAGEMENT

### Software

- STP/RSTP/MSTP, LACP, QoS, IGMP Snooping v1/v2/v3, IGMP Query v1/v2, VLAN, SSH, DNS, HTTP, HTTPS, RADIUS, TACACS+, SNMP v1/v2c/v3, SNMP Traps, TFTP, RMON, LLDP, DHCP Server/Client, DHCP Relay Option 82, Telnet, Syslog, SMTP, SMTP Client, DoS/DDoS auto prevention, MRP, MODBUS TCP

### Security

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

### Configuration

- Web Browser, Cisco-like Telnet CLI, RJ45 console, SNMP

### 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, 48 to 57 V<sub>DC</sub> redundant terminal block input

### Input Current

- Max. 5.5A (with powered device); Max. 0.26A (without powered device)

### Overload Current Protection

- Present, max. input current 10A

### Reverse Polarity Protection

- NOT Present

## PHYSICAL

### Housing

- IP30 metal case

### Dimensions

- 154 mm (H) x 96.4 mm (W) x 105.5 mm (D)

### Weight

- 1205g

### Installation

- DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -40°C to 70°C (-40°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

- EN 60950-1

### EMI

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

### EMS(EN55024)

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

### Environmental Type Tests

#### Shock:

- IEC 60068-2-27

#### Freefall:

- IEC 60068-2-32

#### Vibration:

- IEC 60068-2-6

#### Hi-Pot:

- 1.5KV

## Ordering Information

Product		Port Combination		Interface		
Model Name	Operating Temperature	af/at PoE+, 10/100/1000 Base-T	100/1000 Base-SFP	DI	DO (Relay)	Power Input
DVS-G512W01-4GF	-40°C to 70°C	8	4	---	1	2

### Optional Products

LCP Series: 100Base-FX/1000Base-X SFP Fiber Transceiver. See the LCP Series datasheets for product information.

CliQII/PMC Series: 48 V<sub>DC</sub> Industrial Power Supply

# DVS-G408W01 Series

## IEEE 802.3af/at PoE+ Unmanaged Industrial 8-Port GbE Ethernet Switches



- ▶ 8 10/100/1000Base-T PoE+(PSE) ports
- ▶ Based on IEEE 802.3at standard up to 30Watts per port. Backward compatible with IEEE 802.3af
- ▶ Jumbo frame size up to 9,216 Bytes
- ▶ 48 to 57V<sub>DC</sub> redundant terminal block power input
- ▶ Auto warning by relay output for power failure
- ▶ Compatible with various industrial protocols of EtherNet/IP, Profinet, CC-LINK IE and DNP 3.0

## Specifications

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X)
- IEEE 802.3z 1000Base-X
- IEEE 802.3x Flow Control
- IEEE 802.3af PoE 15.4 Watts
- IEEE 802.3at PoE 30 Watt

#### 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
- PoE+ Pinout:**
- 1 & 2 DC+, 3 & 6 DC-

#### LEDs

- Per Device:**
- PWR1, PWR2, ALARM
- Per Port:**
- PoE, 10/100/1000M, LINK/ACT

#### DIP Switches

- Power failure alarm
- Alarm Contacts (DO)**
- 1 relay output
  - Carry current 1A@24V<sub>DC</sub>

### PERFORMANCE AND SCALABILITY

#### Switching Capacity

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

#### Forwarding Rate

- 11.9Mpps

#### MAC Address Table

- 2K

#### Packet Buffer Memory

- 1.5M bits

#### Jumbo Frame

- 9,216 Bytes

## POWER REQUIREMENTS

### Input Voltage

- 2 sets, 48 to 57 V<sub>DC</sub> redundant terminal block input

### Input Current

- Max. 5A (with powered device); Max. 0.16A (without powered device)

### Overload Current Protection

- Present, max. input current 10A

### Reverse Polarity Protection

- NOT Present

## PHYSICAL

### Housing

- IP30 metal case

### Dimensions

- 144.3 mm (H) x 26.1 mm (W) x 94.9 mm (D)

### Weight

- 390g

### Installation

- Industrial DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -40°C to 70°C (-40°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

- EN 60950-1

### EMI

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

### EMS

- IEC 61000-4-2, EN 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6

## Ordering Information

Product		Port Combination		Interface		
Model Name	Operating Temperature	af/at PoE+, 10/100/1000Base-T	100/ 1000Base-SFP	DI	DO (Relay)	Power Input
DVS-G408W01	-40°C to 70°C	8	---	---	1	2

### Optional Products

CiQII/PMC Series: 48 V<sub>DC</sub> Industrial Power Supplies

# DVS-G406W01-2GF Series

## IEEE 802.3af/at PoE+ Unmanaged Industrial 4-Port GbE + 2-Port 100/1000Base-SFP Ethernet Switches



-40~70°C

EMC  
LEVEL 3

FANLESS

- ▶ 4 10/100/1000Base-T PoE+(PSE) ports
- ▶ Based on IEEE 802.3at standard up to 30Watts per port.  
Backward compatible with IEEE 802.3af
- ▶ SFP ports support 100Base-FX and 1000Base-X dual transmission speed
- ▶ Jumbo frame size up to 9K Bytes
- ▶ 48 to 57V<sub>DC</sub> redundant terminal block power input
- ▶ Auto warning by relay output for power failure
- ▶ Compatible with various industrial protocols of EtherNet/IP, Profinet, CC-LINK IE and DNP 3.0

## Specifications

### 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 802.3af PoE 15.4 Watts
- IEEE 802.3at PoE 30 Watts

#### 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

##### PoE+ Pinout:

- 1 & 2 DC+, 3 & 6 DC-

##### SFP Ports:

- 100/1000Base-SFP

#### LEDs

##### Per Device:

- PWR1, PWR2, ALARM

##### Per Port:

- PoE, 10/100/1000M, LINK/ACT

#### DIP Switches

- Power failure alarm
- SFP speed

#### Alarm Contacts (DO)

- 1 relay output
- Carry current 1A@24V<sub>DC</sub>

### PERFORMANCE AND SCALABILITY

#### Switching Capacity

- 12Gbps, wire-speed, non-blocking switching fabric

#### Forwarding Rate

- 8.9Mpps

#### MAC Address Table

- 1K

#### Packet Buffer Memory

- 1M bits

#### Jumbo Frame

- 9,216 Bytes

## POWER REQUIREMENTS

### Input Voltage

- 2 sets, 48 to 57 V<sub>DC</sub> redundant terminal block input

### Input Current

- Max. 2.52A (with powered device); Max. 0.13A (without powered device)

### Overload Current Protection

- Present, max. input current 10A

### Reverse Polarity Protection

- NOT Present

## PHYSICAL

### Housing

- IP30 metal case

### Dimensions

- 144.3 mm (H) x 26.1 mm (W) x 94.9 mm (D)

### Weight

- 410g

### Installation

- Industrial DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -40°C to 70°C (-40°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

- EN 60950-1

### EMI

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

### EMS

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

## Ordering Information

Product		Port Combination		Interface		
Model Name	Operating Temperature	af/at PoE+, 10/100/1000Base-T	100/ 1000Base-SFP	DI	DO (Relay)	Power Input
DVS-G406W01-2GF	-40°C to 70°C	4	2	---	1	2

### Optional Products

LCP Series: 100Base-FX/1000Base-X SFP Fiber Transceiver. See the LCP Series datasheets for product information.

ClIQII/PMC Series: 48 V<sub>DC</sub> Industrial Power Supplies

# DVS-G402R00-INJ Series

## 2 10/100/1000Base-T Industrial IEEE 802.3af/at PoE+ Injectors



- ▶ Based on IEEE 802.3at standard up to 30Watts per port.  
Backward compatible with IEEE 802.3af
- ▶ Dual 10/100/1000Base-T for PoE+ OUT and DATA IN
- ▶ Intelligent PoE+ overvoltage input protection
- ▶ Reverse polarity and overload current protection
- ▶ Built-in 12V<sub>DC</sub> power booster for flexible PoE deployment
- ▶ Dual power outputs design to supply more devices

## Specifications

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X)
- IEEE 802.3ab 1000Base-T
- IEEE 802.3af PoE 15.4 Watts
- IEEE 802.3at PoE 30 Watts

### INTERFACE

#### Gigabit Ethernet

##### RJ45 Ports:

- 2 10/100/1000Base-T PoE+ OUT, 2 10/100/1000Base-T DATA IN, auto MDI/MDI-X, auto negotiation

##### PoE+ Pinout:

- 1 & 2 DC +, 3 & 6 DC -

#### LEDs

##### Device:

- PWR

##### Port:

- PoE+

### POWER REQUIREMENTS

#### Input Voltage

- 2 sets, 12 to 57 V<sub>DC</sub> redundant terminal block input

#### Input Current

- Max. 5.5A (with powered device)

#### PoE+ Output Power

- Max. 600mA @ 50 V<sub>DC</sub>, 30 watts per port

#### Overload Current Protection

- Present, max. input current 10A

#### Reverse Polarity Protection

- Present

## PHYSICAL

### Housing

- IP30 metal case

### Dimensions

- 95 mm(H) x 41 mm(W) x 70 mm (D)

### Weight

- 370g

### Installation

- DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -20°C to 70°C (-4°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

- EN 60950-1

### EMI

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

### EMS

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

### Environmental Type Tests

#### Shock:

- IEC 60068-2-27

#### Freefall:

- IEC 60068-2-32

#### Vibration:

- IEC 60068-2-6

## Ordering Information

Product		Port Combination		Interface		
Model Name	Operating Temperature	af/at PoE+, 10/100/1000Base-T	10/100/1000Base-T	DI	DO (Relay)	Power Input
DVS-G402R00-INJ	-20°C to 70°C	2	2	---	---	2

### Optional Products

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48 V<sub>DC</sub> Industrial Power Supply

# DVS-G401R00-SPL Series

## 1 10/100/1000Base-T Industrial IEEE 802.3af/at PoE+ Splitters



- ▶ Based on IEEE 802.3at standard up to 30Watts per port.  
Backward compatible with IEEE 802.3af
- ▶ 10/100/1000Base-T for PoE+ IN and DATA OUT
- ▶ Intelligent PoE input overvoltage protection
- ▶ Reverse polarity and port isolation protection
- ▶ Power output up to 27 watts
- ▶ Dual power outputs design to supply more devices

## Specifications

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X)
- IEEE 802.3ab 1000Base-T
- IEEE 802.3af PoE 15.4 Watts
- IEEE 802.3at PoE 30 Watts

### INTERFACE

#### Gigabit Ethernet

##### RJ45 Ports:

- 1 10/100/1000Base-T PoE+ IN, 1 10/100/1000Base-T DATA OUT, auto MDI/MDI-X, auto negotiation

##### PoE+ Pinout:

- PD auto negotiation (1 & 2 DC +, 3 & 6 DC- or 4 & 5 DC +, 7 & 8 DC-)

#### LEDs

##### Device:

- PWR

### POWER REQUIREMENTS

#### PoE+ Input Voltage

- 36 to 57 V<sub>DC</sub>

#### Output Voltage

- 2 sets, 24 V<sub>DC</sub> redundant terminal block

#### Output Current

- Max. 1.125A

#### Overload Current Protection

- Present, adjust by PoE power classes

#### Reverse Polarity Protection

- Present

## PHYSICAL

### Housing

- IP30 metal case

### Dimensions

- 95 mm(H) x 26.1 mm(W) x 70 mm (D)

### Weight

- 250g

### Installation

- DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -20°C to 70°C (-4°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

- EN 60950-1

### EMI

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

### EMS (EN 55024)

- IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11

### Environmental Type Tests

#### Shock:

- IEC 60068-2-27

#### Freefall:

- IEC 60068-2-32

#### Vibration:

- IEC 60068-2-6

## Ordering Information

Product		Port Combination		Interface		
Model Name	Operating Temperature	af/at PoE+, 10/100/1000Base-T	10/100/1000Base-T	DI	DO (Relay)	Power Output
DVS-G401R00-SPL	-20°C to 70°C	1	1	---	---	2

# DVS-G002I00C-TF Series

## Industrial 1-Port 100/1000Base-T to 100/1000Base-SFP Media Converter



UL61010



-20~70°C



FANLESS

- ▶ 12 to 48 V<sub>DC</sub> redundant terminal block power input
- ▶ Supports Link fault Pass-Through (LFP)
- ▶ Jumbo frame size up to 10K Bytes
- ▶ -20°C to 70°C operating temperature

## Specifications

### TECHNOLOGY

#### Standard Compliance

- IEEE 802.3u 100Base-T(X) and 100Base-FX
- IEEE 802.3ab 1000Base-T
- IEEE 802.3z 1000Base-X
- 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

#### Gigabit Ethernet

##### RJ45 Ports:

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

##### SFP Ports:

- 100/1000Base-SFP

#### LEDs

##### Per Device:

- PWR1, PWR2

##### Per Port:

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

#### DIP Switch

- 100M or 1000M selection

### PERFORMANCE AND SCALABILITY

#### Jumbo Frame

- 10K Bytes

#### Link fault Pass-Through

- Present

### POWER REQUIREMENTS

#### Input Voltage

- 2 set, 12 to 48 V<sub>DC</sub> redundant terminal block input

#### Input Current

- Max. 0.15A

#### Overload Current Protection

- Present, max. input current 0.5A

#### Reverse Polarity Protection

- Present

## PHYSICAL

### Housing

- IP40 PC plastic

### Dimensions

- 110mm (H) x 28mm (W) x 75mm (D)

### Weight

- 110g

### Installation

- Industrial DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -20°C to 70°C (-4°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 61010, IEC 62368-1

### EMI

- FCC 47 CFR Part 15 Subpart B Class A, IEC61000-6-4, EN 55032, AS/NZS CISPR 32

### EMS [IEC61000-6-2, EN 55024]

- 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 3, IEC 61000-4-8 level 4, IEC 61000-4-17

### 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:

- 500V

## Ordering Information

Product		Port Combination			Interface		
Model Name	Operating Temperature	Combo Port 10/100/1000Base-T and 100/1000Base-SFP	100/1000 Base-T	100/ 1000Base- SFP	DI	DO (Relay)	Power Input
DVS-G002I00C-TF	-20°C to 70°C	---	1	1	---	---	2

### Optional Products

LCP Series: 100Base-FX/1000Base-X SFP Fiber Transceiver. See the LCP Series datasheets for product information.

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48V<sub>DC</sub> Industrial Power Supply

# LCP-GbE Series

## 1-Port Gigabit Ethernet SFP Fiber Transceivers

- ▶ 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 EN 60825-1)
- ▶ Metal case for better EMI immunity
- ▶ Wide operating temperature



## Specifications

### 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-1000SX	LCP-1000LX10	LCP-1000LHX40
Cable	50/125µm MultiMode	9/125µm SingleMode	9/125µm SingleMode
Wavelength	850nm	1310nm	1310nm
Max. TX Power	-4dBm	-3dBm	3dBm
Min. TX Power	-9.5dBm	-9.5dBm	-3dBm
RX Sensitivity	-18dBm	-20dBm	-24dBm
Optical Budget	8.5dBm	10.5dBm	21dBm

## PHYSICAL

### Housing

- Metal case

### Dimensions

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

- EN 60825-1

### EMI

- FCC 47 CFR Part 15 Subpart B Class B, EN 55032

### EMS

- EN 55024

## 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-1000SX	LCP-1000SXT	Duplex LC	MultiMode	500m
LCP-1000LX10	LCP-1000LX10T	Duplex LC	SingleMode	10km
LCP-1000LHX40	LCP-1000LHX40T	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 Transceivers



- ▶ 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 EN 60825-1)
- ▶ Metal case for better EMI immunity
- ▶ Wide operating temperature

## Specifications

### 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-100MMF	LCP-100SMF30	LCP-100SMF60
Cable	62.5/125µm MultiMode	9/125µm SingleMode	9/125µm SingleMode
Wavelength	1310nm	1310nm	1310nm
Max. TX Power	-14dBm	-8dBm	0dBm
Min. TX Power	-20dBm	-15dBm	-5dBm
RX Sensitivity	-31dBm	-34dBm	-35dBm
Optical Budget	11dBm	19dBm	30dBm

## PHYSICAL

### Housing

- Metal case

### Dimensions

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

- EN 60825-1

### EMI

- FCC 47 CFR Part 15 Subpart B Class B, EN 55032

### EMS

- EN 55024

## 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-100MMF	LCP-100MMFT	Duplex LC	MultiMode	2km
LCP-100SMF30	LCP-100SMF30T	Duplex LC	SingleMode	30km
LCP-100SMF60	LCP-100SMF60T	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 .....	75
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## Wireless AP

DVW-W02W2-E2 Series: Industrial IEEE 802.11 a/b/g/n Wireless AP/WDS/Client/Gateway .....	80
DVW-W01I2-E1 Series: Industrial IEEE 802.11 a/b/g/n/ac Wireless AP/Client/Gateway .....	83

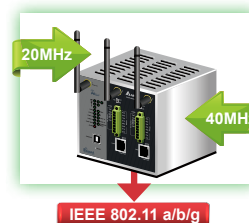
## High-gain Antennas

DVW-ANTRM8N-B3 Series: 2.4 & 5GHz Dual-band Omni-directional 5.5 & 8dBi High-gain Antennas .....	86
DVW-ANTRM7G-B3 Series: 2.4GHz Omni-directional 7dBi High-gain Antennas .....	87

## IEEE 802.11 WLAN

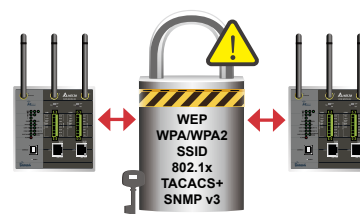
### IEEE 802.11n Technology

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.



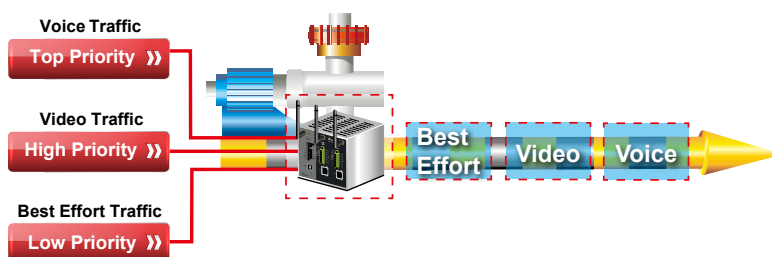
### Enhanced WLAN Security Management

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



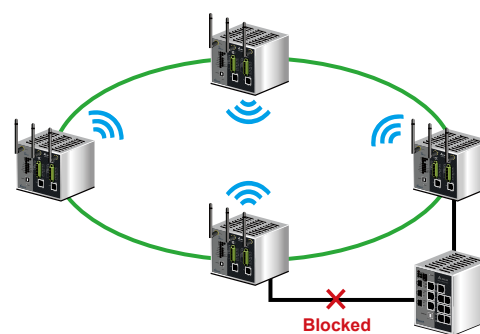
### Wi-Fi Multimedia

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



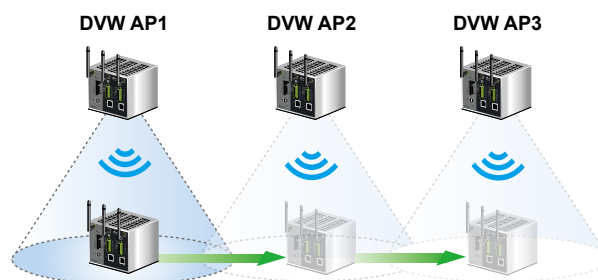
### STP/RSTP

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.



### Industrial-grade Fast Roaming

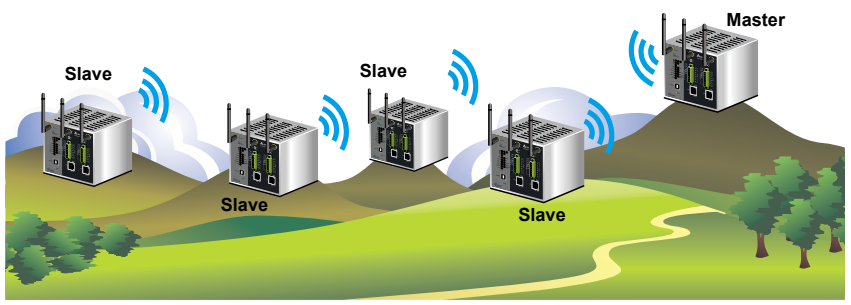
Delta's Fast Roaming technology helps users achieve quick roaming through the access points in the industrial field. This technology enables wireless devices to handover within milliseconds, creating a high-reliability wireless network, that is especially suitable for mobile applications, such as automatic guided vehicles (AGV).



# Versatile Wireless Spot

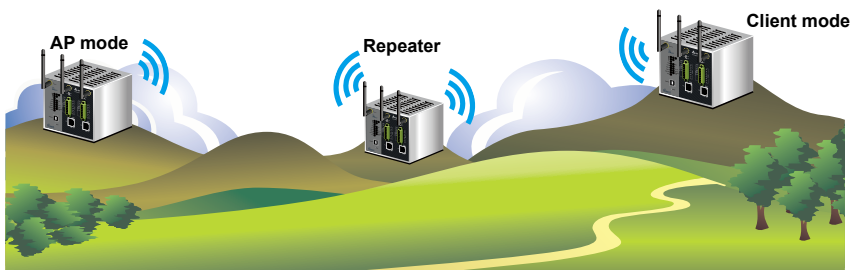
## Wireless Distribution System (WDS) Point-to-Multipoint Mode

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



## Wireless Distribution System Repeater Mode

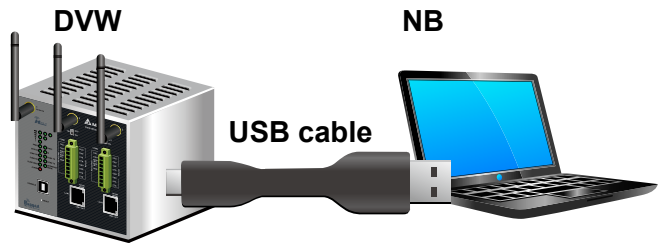
Wireless connection is often limited by the effective transmission distance between two ends. The WDS repeater mode extends the transmission distance to overcome this distance limit.



# A Seamless Interconnection

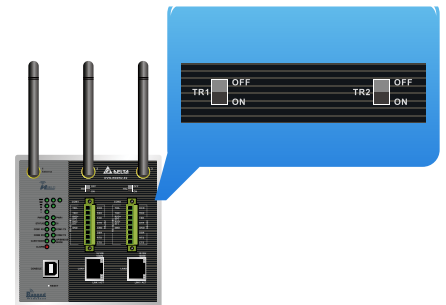
## USB Console Interface

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



## Adjustable Terminal Resistors

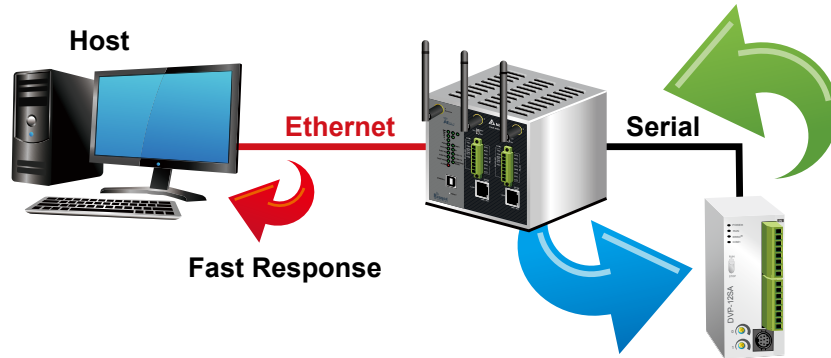
For applications that use RS-485 communication, signal reflection in cables often causes interference and poor communication quality. Using adjustable terminal resistors that switch on/off according to requirements improves communication quality.



# MODBUS Cache

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

The DVW Series Wireless APs 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.

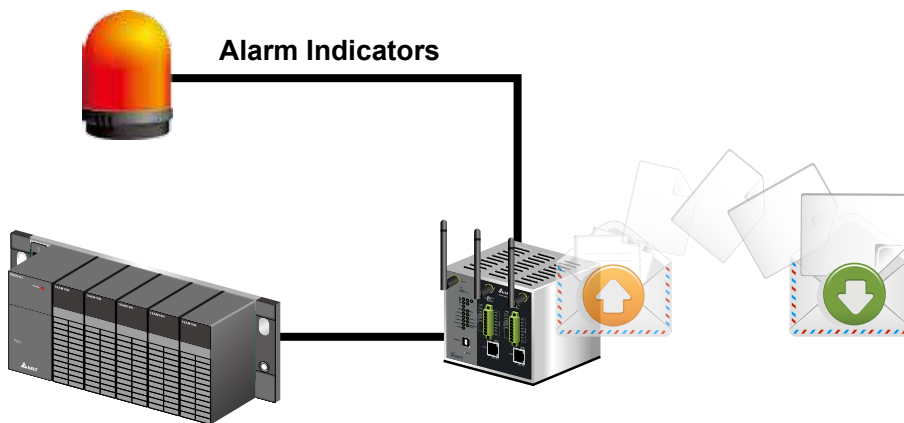


Online Real-time Monitoring

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

# Digital Inputs

Designed for industrial environments, the DVW Series Wireless APs easily connect to various industrial devices, such as programmable logic controllers (PLC) or sensors, and deliver real-time alarms to users via relay output or email.

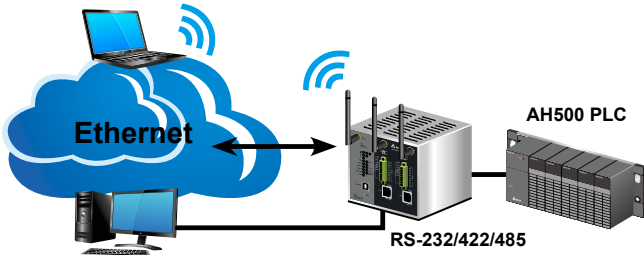


# Introduction to Serial Device Servers

## Virtual COM

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

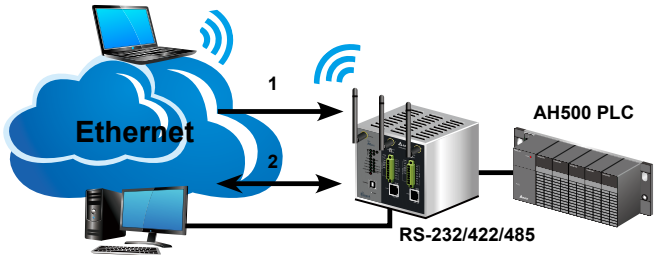
COM6 = 192.168.1.200:2000



COM5 = 192.168.1.100:1000

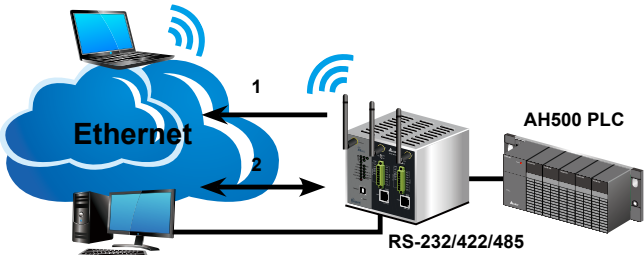
## TCP Server

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 Series passively receives the request for connection and conducts transmission of serial device data via wired or wireless communication.



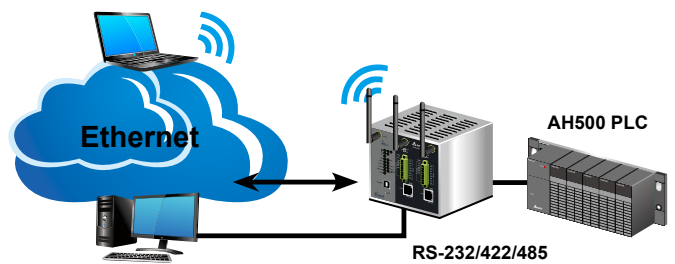
## TCP Client

In a TCP/IP network, each serial port has one exclusive set of IP address and TCP serial port number. When a DVW Series 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.



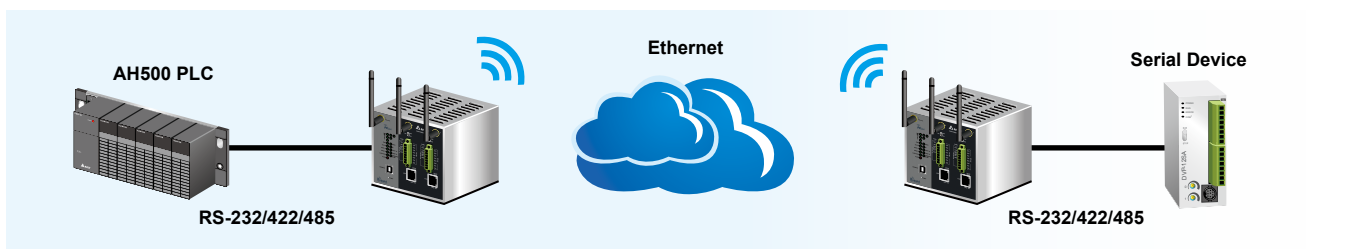
## UDP Mode

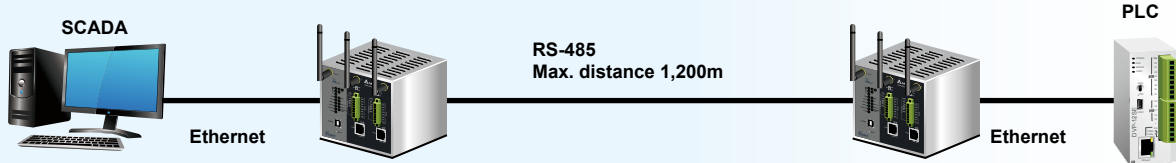
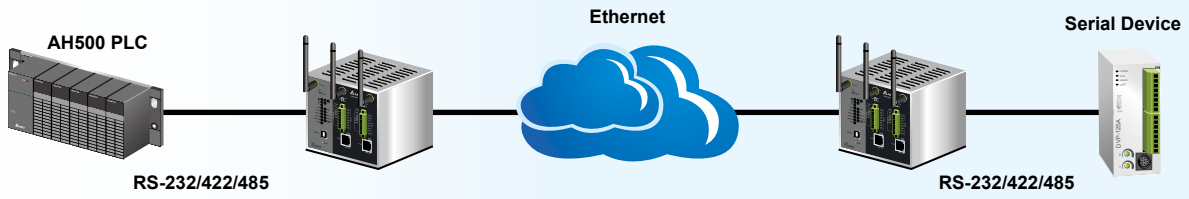
Serial devices can connect to hosts for continuous data transmission via wired or wireless communication with a DVW Series. The UDP mode enables better transmission performance compared to the TCP mode, and it is suitable for real-time information display systems, such as electronic billboards. It is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



## Pair Connection

Pair a DVW Series 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 communication for a longer transmission distance of up to 1,200m.

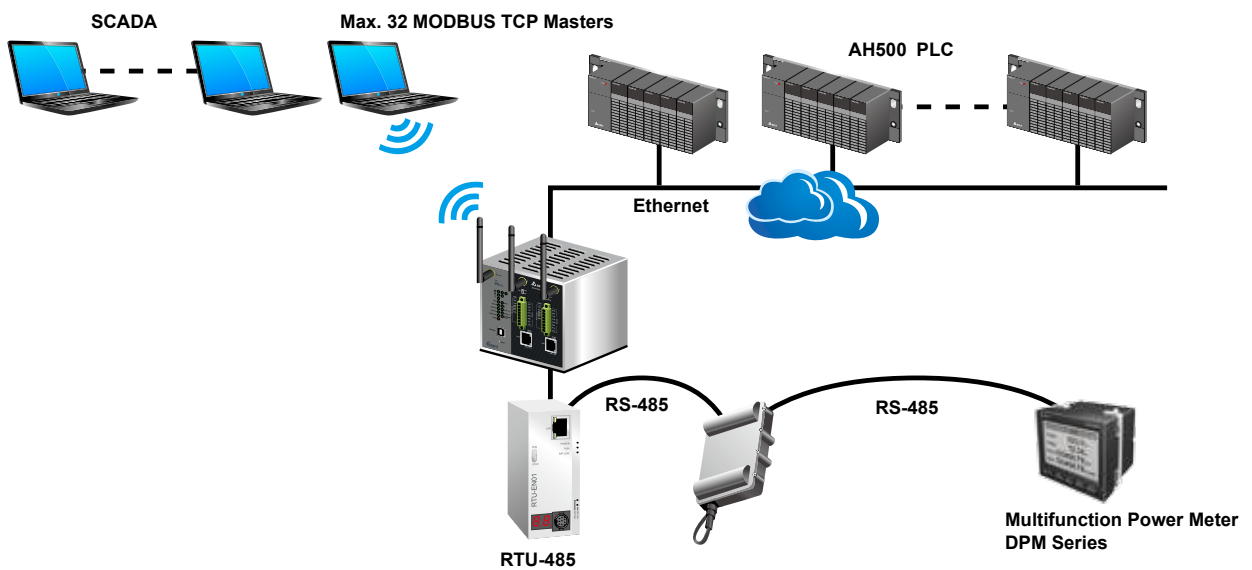




## Introduction to MODBUS Gateway

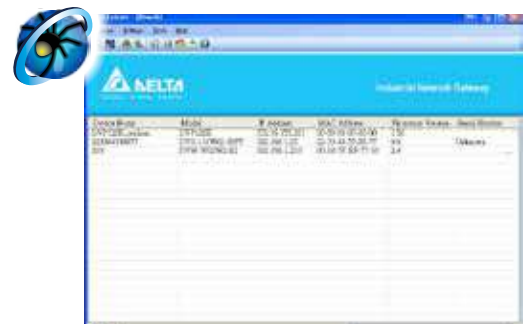
### ▲ 32 TCP Masters with 32 TCP Slaves

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 friendly access to search for all IES products on the network. One simple click calls 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
- ▶ IEEE 802.11r fast roaming, seamless roaming recovery time between APs<50ms
- ▶ 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
- ▶ 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

## Specifications

### 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@24V<sub>DC</sub>

### 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 (±2dBm)
- 36Mbps: 16dBm (±2dBm)
- 48Mbps: 14dBm (±2dBm)
- 54Mbps: 13dBm (±2dBm)

#### 802.11b (per chain):

- 1Mbps to 11Mbps: 19dBm (±2dBm)

#### 802.11g:

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

### RF Output Power MIMO

#### (Max., per chain)

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

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

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

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

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

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

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

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

### 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(2.4G HT20):

- -93dBm @ MCS0, -81dBm @ MCS5, -79dBm @ MCS6, -76dBm @ MCS7
- -93dBm @ MCS8, -83dBm @ MCS12, -77dBm @ MCS14, -75dBm @ MCS15
- -92dBm @ MCS16, -82dBm @ MCS20, -75dBm @ MCS22, -72dBm @ MCS23

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

- -90dBm @ MCS0, -79dBm @ MCS5, -75dBm @ MCS6, -74dBm @ MCS7
- -90dBm @ MCS8, -81dBm @ MCS12, -74dBm @ MCS14, -72dBm @ MCS15
- -90dBm @ MCS16, -79dBm @ MCS20, -72dBm @ MCS22, -69dBm @ MCS23

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

- -92dBm @ MCS0, -91dBm @ MCS2, -83dBm @ MCS4, -79dBm @ MCS5, -77dBm @ MCS6, -74dBm @ MCS7
- -91dBm @ MCS8, -81dBm @ MCS12, -71dBm @ MCS15
- -90dBm @ MCS16, -79dBm @ MCS20, -72dBm @ MCS22, -69dBm @ MCS23

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

- -89dBm @ MCS0, -88dBm @ MCS2, -81dBm @ MCS4, -77dBm @ MCS5, -74dBm @ MCS6, -72dBm @ MCS7
- -89dBm @ MCS8, -78dBm @ MCS12, -71dBm @ MCS15
- -88dBm @ MCS16, -77dBm @ MCS20, -71dBm @ MCS22, -69dBm @ MCS23

## MANAGEMENT

### Software

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

### Security

- Security Access:**
- MAC/IP/TCP/UDP filtering, HTTPS, SSH, 802.1X, 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 V<sub>DC</sub> redundant terminal block input

### Input Current

- Max. 1.02A

### Overload Current Protection:

- Present, max. input current 3A

### Reverse Polarity Protection

- Present

### Voltage Dips Protection Time

- Min. 12ms at 24V<sub>DC</sub>

## 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 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48 V<sub>DC</sub> Industrial Power Supply

# DVW-W01I2-E1

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



UL61010



FANLESS

- ▶ Compliant with IEEE 802.11ac wireless technology capable of up to 866Mbps data rate
- ▶ Compliant with IEEE 802.11n wireless technology capable of up to 300Mbps data rate
- ▶ Backward compatible with 802.11 a/b/g standard for seamless integration
- ▶ Multiple Wireless Modes: AP, Client
- ▶ 2 x 2 MIMO technology increases data rate
- ▶ Proprietary ONE ROAMING industrial-grade fast roaming, seamless roaming recovery time between APs < 150ms
- ▶ Wireless QoS(IEEE 802.11e, WMM) for video packets precedence transmission
- ▶ Enhanced wireless security: WPA-PSK / WPA2-PSK (TKIP/AES)
- ▶ Supports 2-port RS-232/485-to-Ethernet Device Server
- ▶ Built-in 2-port MODBUS ASCII/RTU to MODBUS TCP Gateway
- ▶ Built-in 10MB buffer memory avoids data loss once the connection is down
- ▶ DHCP/BootP server for automatic IP assignment, helping build up network easily
- ▶ SNTP (simple network time protocol) for network clock synchronization
- ▶ Support 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, Relay

## Specifications

### TECHNOLOGY

#### Standard Compliance

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

#### Processing Type

- CSMA/CA

### INTERFACE

#### Wireless

##### IEEE 802.11 a/b/g/n/ac:

- 2T2R

#### Antennas:

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

## INTERFACE

### Gigabit Ethernet

#### RJ45 Port:

- 1 10/100/1000Base-T, auto MDI/MDI-X, auto negotiation

### Serial Communication

#### Serial Ports :

- 1 RS-232 (5-pin terminal block), 1 RS-485(3-pin terminal block), 2KV isolation protection

#### Baud Rate:

- 2400bps to 115200bps

#### Data Bits:

- 7, 8

#### Parity:

- None, Even, Odd

#### Stop Bits:

- 1, 2

#### Flow Control:

- RTS/CTS (RS-232 only)

#### RS-232:

- TxD, RxD, RTS, CTS, GND

#### RS-485:

- D+, D-, GND

### LEDs

#### Device:

- PWR1/PWR2, DI/ALARM, Signal Strength

#### RJ45 Port:

- 10/100/1000M, LINK/ACT

#### Serial Ports:

- RS-232, RS-485

### Digital Inputs (DI)

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

### Alarm Contacts (DO)

- 1 relay output
- Carry current 1A@24V<sub>DC</sub>

### 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

#### 802.11ac:

- BPSK, QPSK, 16QAM, 64QAM, 256QAM 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)
- 5.180GHz ~ 5.240GHz (4 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

#### 802.11ac mode:

- up to 866Mbps

#### 802.11n mode:

- up to 300Mbps

#### 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 36Mbps: 21dBm ( $\pm 1.5$ dBm)
- 48Mbps: 20dBm ( $\pm 1.5$ dBm)
- 54Mbps: 19dBm ( $\pm 1.5$ dBm)

#### 802.11b:

- 1Mbps to 11Mbps: 22dBm ( $\pm 1.5$ dBm)

#### 802.11g:

- 6Mbps to 24Mbps: 20dBm ( $\pm 1.5$ dBm)
- 36Mbps: 19dBm ( $\pm 1.5$ dBm)
- 48/54Mbps: 18dBm ( $\pm 1.5$ dBm)

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

#### 802.11n (2.4G HT20/40):

- MCS0: 20dBm ( $\pm 1.5$ dBm)
- MCS7: 18dBm ( $\pm 1.5$ dBm)

#### 802.11n (5G HT20/40):

- MCS0: 21dBm ( $\pm 1.5$ dBm)
- MCS7: 19dBm ( $\pm 1.5$ dBm)

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

- MCS0: 21dBm ( $\pm 1.5$ dBm)
- MCS8: 17dBm ( $\pm 1.5$ dBm)

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

- MCS0: 21dBm ( $\pm 1.5$ dBm)
- MCS8: 17dBm ( $\pm 1.5$ dBm)
- MCS9: 15dBm ( $\pm 1.5$ dBm)

#### 802.11ac (5G HT80):

- MCS0: 19dBm ( $\pm 1.5$ dBm)
- MCS8: 16dBm ( $\pm 1.5$ dBm)
- MCS9: 15dBm ( $\pm 1.5$ dBm)

### Receiver Sensitivity

#### 802.11a:

- -86dBm @ 6Mbps, -85dBm @ 9Mbps, -83dBm @ 12Mbps, -83dBm @ 18Mbps, -81dBm @ 24Mbps, -78dBm @ 36Mbps, -74dBm @ 48Mbps, -73dBm @ 54Mbps

#### 802.11b:

- -99dBm @ 1Mbps, -97dBm @ 2Mbps, -94dBm @ 5.5Mbps, -92dBm @ 11Mbps

#### 802.11g:

- -91dBm @ 6Mbps, -91dBm @ 9Mbps, -90dBm @ 12Mbps, -89dBm @ 18Mbps, -86dBm @ 24Mbps, -81dBm @ 36Mbps, -77dBm @ 48Mbps, -75dBm @ 54Mbps

### Receiver Sensitivity MIMO

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

- -92dBm @ MCS0, -72dBm @ MCS7

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

- -90dBm @ MCS0, -70dBm @ MCS7

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

- -89dBm @ MCS0, -71dBm @ MCS7

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

- -87dBm @ MCS0, -68dBm @ MCS7

#### 802.11ac (5G HT20)

- -89dBm @ MCS0, -66dBm @ MCS9

#### 802.11ac (5G HT40)

- -86dBm @ MCS0, -61dBm @ MCS9

#### 802.11ac (5G HT80)

- -84dBm @ MCS0, -58dBm @ MCS9

## MANAGEMENT

### Software

- SSH, HTTPS, HTTP, TFTP, BootP Server/Client, DHCP Server/Client, Telnet, Syslog, ARP, MODBUS TCP, SNMP

### Security

#### Security Access:

- SSH

#### Wireless Security:

- 802.11i, 64/128-bit WEP, 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)
- Windows 10 (32/64 bits)

### Configuration

- Web Browser, 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 48V<sub>DC</sub> redundant terminal block inputs

### Input Current

- Max. 0.92A

### Overload Current Protection:

- Present, Max. Input current 3A

### Reverse Polarity Protection

- Present

## PHYSICAL

### Housing

- IP40 PC plastic

### Dimensions

- 110 mm(H) x 28 mm(W) x 75 mm (D)

### Weight

- 198g

### 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 61010, IEC 62368-1

### EMI

- FCC 47 CFR Part 15 Subpart B Class A, IEC 61000-6-4, EN 55011, EN 55032(CISPR32), EN 301 489-1/17

### EMS

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

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

### RF

- EN 300 328, EN 301 893, NCC, SRRC, RCM
- 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	RS-485	DI	DO (Relay)	Power Input	Band	
DVW-W01I2-E1	-10°C to 60°C	1	1	1	1	1	2	US	USA, Taiwan
DVW-W01I2-E1-EU	-10°C to 60°C	1	1	1	1	1	2	EU	European Union, Australia, New Zealand
DVW-W01I2-E1-CN	-10°C to 60°C	1	1	1	1	1	2	CN	China(PRC)

NOTE: For available countries for purchase, please contact your regional sales or distributors.

### Optional Products

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48 V<sub>DC</sub> Industrial Power Supply

# DVW-ANTRM8N-B3 Series

## 2.4 & 5GHz Dual-band Omni-directional 5.5 & 8dBi High-gain Antennas



- ▶ 8dBi high-gain antenna to enhance wireless access performance
- ▶ Powerful magnetic base with 3 meters extended cable, RP-SMA (male) connector
- ▶ IP65 weather proof with UV resistant design, suitable for all weather conditions
- ▶ Easy installation for indoor or outdoor environments

## Specifications

### ANTENNA CHARACTERISTICS

#### Standard Compliance

- Wireless Signal:**
- IEEE 802.11 a/b/g/n
- Typical Application:**
- Indoor / Outdoor
- Frequency:**
- 2.4 to 2.5GHz
  - 4.9 to 5.9GHz

- Antenna Type:**
- Omni-directional
- Typical Gain:**
- 5.5dBi @ 2.4GHz
  - 8dBi @ 5GHz

- Beam Width:**
- 2.4GHz @ H: 360° / E: 60.1°
  - 5.8GHz @ H: 360° / E: 21.3°
- Polarization:**
- Vertical
- V.S.W.R:**
- ≤ 2.0

- Power Handling:**
- 5W
- Impedance:**
- 50Ω±5Ω

### PHYSICAL CHARACTERISTICS ENVIRONMENTAL LIMITS

- Base**
- Connector:**
- RP-SMA (male) for device, N-type (female) for antenna
- Low-Loss Cable Length:**
- 3 meters
- Low-Loss Cable Type:**
- CFD-200-NL
- Low-Loss Cable Power Loss:**
- ≤ 2.4dB (2.4GHz)
  - ≤ 3.2dB (5GHz)
- Radome Material:**
- Brass

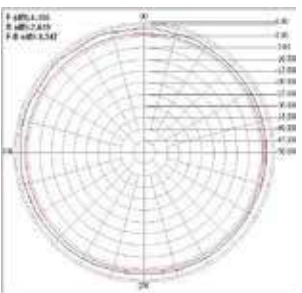
- Radome Color:**
- Black
- Height:**
- 44.6mm
- Diameter:**
- 77.4mm
- Weight:**
- 56g
- Installation:**
- Magnetic mount

- Antenna**
- Connector:**
- N-type (male)
- IP Protection:**
- IP65
- Radome Material:**
- Fiberglass, UV resistant
- Radome Color:**
- White
- Length:**
- 203mm
- Diameter:**
- 22.4mm
- Weight:**
- 86g

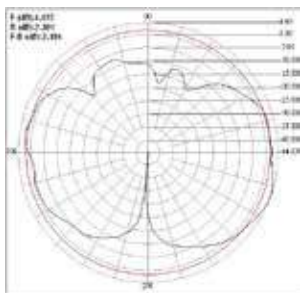
- Operating Temperature**
- -30°C to 60°C (-22°F to 140°F)
- Storage Temperature**
- -40°C to 85°C (-40°F to 185°F)
- Ambient Relative Humidity**
- 5% to 95% (non-condensing)

### FIELD PATTERNS

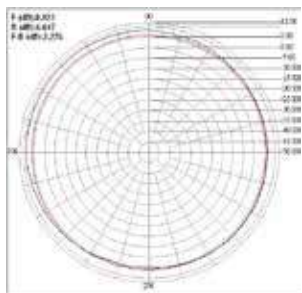
H-PLANE for 2.4GHz



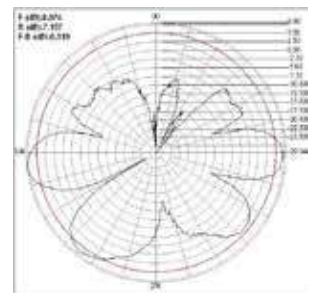
E-PLANE for 2.4GHz



H-PLANE for 5.8GHz



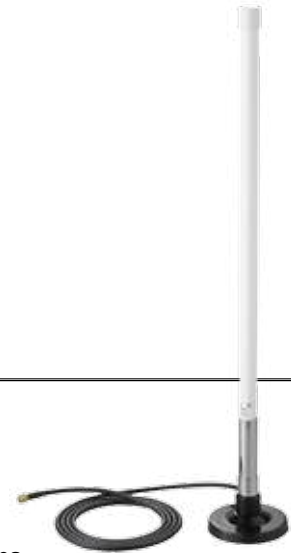
E-PLANE for 5.8GHz



# DVW-ANTRM7G-B3 Series

## 2.4GHz Omni-directional 7dBi High-gain Antennas

- ▶ 7 dBi high-gain antenna to enhance wireless access performance
- ▶ Powerful magnetic base with 3 meters extended cable, RP-SMA (male) connector
- ▶ IP65 weather proof with UV resistant design, suitable for all weather conditions
- ▶ Easy installation for indoor or outdoor environments



## Specifications

### ANTENNA CHARACTERISTICS

#### Standard Compliance

##### Wireless Singal:

- IEEE 802.11 b/g/n

##### Typical Application:

- Indoor / Outdoor

##### Frequency:

- 2.4 to 2.5GHz

##### Antenna Type:

- Omni-directional

##### Typical Gain:

- 7dBi

##### Beam Width:

- H: 360° / E: 20.7

##### Polarization:

- Vertical

##### V.S.W.R:

- $\leq 2.0$

##### Power Handling:

- 10W

##### Impedance:

- $50\Omega \pm 5\Omega$

### PHYSICAL CHARACTERISTICS

#### Base

##### Connector:

- RP-SMA (male) for device,

- N-type (female) for antenna

##### Low-Loss Cable Length:

- 3 meters

##### Low-Loss Cable Type:

- CFD-200-NL

##### Low-Loss Cable Power Loss:

- $\leq 2.4\text{dB}$

##### Radome Material:

- Brass

##### Radome Color:

- Black

##### Height:

- 44.6mm

##### Diameter:

- 77.4mm

##### Weight:

- 56g

##### Installation:

- Magnetic mount

#### Antenna

##### Connector:

- N-type (male)

##### IP Protection:

- IP65

##### Radome Material:

- Fiberglass, UV resistant

##### Radome Color:

- White

##### Length:

- 450mm

##### Diameter:

- 20mm

##### Weight:

- 180g

### ENVIRONMENTAL LIMITS

#### Operating Temperature

- -30°C to 60°C (-22°F to 140°F)

#### Storage Temperature

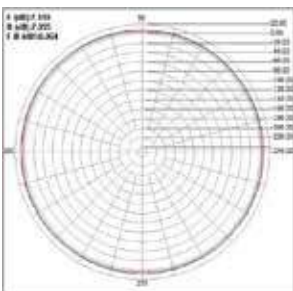
- -40°C to 85°C (-40°F to 185°F)

#### Ambient Relative Humidity

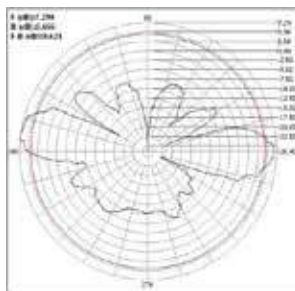
- 5% to 95% (non-condensing)

### FIELD PATTERNS

#### H-PLANE



#### E-PLANE



# IIoT Routers

## DIACloud Routers

DX-3021L9 Series: Industrial 4G/WAN DIACloud Cloud Routers .....	89
DX-3001H9 Series: Industrial 3G/WAN DIACloud Cloud Routers .....	92
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## VPN Routers

DX-3001H9-V Series: Industrial 3G/WAN VPN Routers .....	101
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## DX-3021L9 Series

### Industrial 4G/WAN DIACloud Cloud Routers



- ▶ A data acquisition device connected to DIACloud cloud servers. Supports a two-way data collection channel between the devices and the cloud
- ▶ Sets up a secure tunnel between the user and the remote device via DIACloud cloud servers, without the need of additional VPN server
- ▶ Supports MODBUS TCP, MODBUS ASCII/RTU, Mitsubishi MC and Siemens ISO-on-TCP protocols
- ▶ Universal 4G LTE-FDD and LTE-TDD frequency bands, backward compatible with WCDMA/GSM/GPRS/EDGE 3G/2G networks
- ▶ LTE data transmission rate up to 150Mbps (downlink) / 50Mbps (uplink)
- ▶ Dual SIM dual standby technology, auto-switching between cellular operators without restarting devices
- ▶ Automatic APN parameter matching and connection redial
- ▶ Connecting to internet through by cellular network or broadband interfaces. Come with indication the priority of internet connectivity interfaces activated
- ▶ Various peripheral interfaces include RS-485, RS-232 and 4 LAN ports
- ▶ DI/DO built-in, users can trigger warning by specific events
- ▶ Support to upgrade device firmware and configure automatically via USB flash drive. Users can remotely access the USB flash drive by FTP also
- ▶ Built-in RTC and supports NTP time synchronization over a network
- ▶ Firewall function: Stateful Packet Inspection (SPI), prevent denial of service (DoS) attacks, MAC address filter and IP port filter
- ▶ Supports TCP/IP, UDP, ICMP, DHCP, HTTP, DNS and SSH protocols
- ▶ Scheduled jobs are available
- ▶ Device configurations import/export
- ▶ Network data flow statistics
- ▶ Networking failure diagnostics
- ▶ Device and PLC interlocking
- ▶ Custom alarm conditions with email alerts

## Specifications

### TECHNOLOGY

#### Standard Compliance

- GSM/GPRS/EDGE/ UMTS/DC-HSPA+/LTE
- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X)

## INTERFACE

### 4G

#### GSM/GPRS/EDGE/UMTS/DC-HSPA+/LTE

##### Antennas:

- 1 2.5dBi omni-directional, SMA (male) connector, 3 meters cable with magnetic stand

##### Fast Ethernet

##### RJ45 Ports:

- WAN: 1 10/100Base-T(X), auto MDI/MDI-X, auto negotiation
- LAN: 4 10/100Base-T(X), auto MDI/MDI-X, auto negotiation

##### Serial Communication

##### Serial Ports :

- 1 RS-232 (5-pin terminal block), 1 RS-485 (3-pin terminal block), 15KV isolation protection

##### Baud Rate:

- 2400bps to 115200bps

##### Data Bits:

- 7, 8

##### Parity:

- None, Even, Odd

##### Stop Bits:

- 1, 2

##### Flow Control:

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

##### RS-232:

- TxD, RxD, RTS, CTS, GND

##### RS-485

- D+, D-, GND

##### USB

- USB 2.0 host, type A

##### LEDs

##### Device:

- POWER, READY, USB, DI1, DI2, DO1, DO2, Signal Strength

##### RJ45 Ports:

- 100M, LINK/ACT

##### Serial Ports:

- RS-232, RS-485

##### 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 1A@24V<sub>DC</sub>

##### SIM Card

- Number of SIMs: 2, SIM 25mm x 15mm
- SIM Control: 1.8V/3V

##### Reset Button

- 1 set

### 4G RF

#### Frequency Band:

- LTE FDD: B1, B2, B3, B4, B5, B7, B8, B12, B13, B18, B19, B20, B25, B26, B28
- LTE TDD: B38, B39, B40, B41
- UMTS: B1, B2, B4, B5, B6, B8, B19
- GSM: 850, 900, 1800, 1900MHz

#### Data Transmission Rates

##### LTE:

- LTE FDD Up link 50Mbps, down link 150Mbps
- LTE TDD Up link 30Mbps, down link 130Mbps

##### UMTS:

- DC-HSDPA Down link 42Mbps
- HSUPA Up link 5.76Mbps
- WCDMA Down link 384Kbps, up link 384Kbps

##### GSM:

- EDGE Up link 236.8Kbps, down link 296Kbps
- GPRS Up link 85.6Kbps, down link 107Kbps

#### RF Output Power:

- Class 4 (33dBm±2dB) @ GSM850
- Class 4 (33dBm±2dB) @ EGSM900
- Class 1 (30dBm±2dB) @ DCS1800
- Class 1 (30dBm±2dB) @ PCS1900
- Class E2 (27dBm±3dB) @ GSM850 8-PSK
- Class E2 (27dBm±3dB) @ EGSM900 8-PSK
- Class E2 (26dBm±3dB) @ DCS1800 8-PSK
- Class E2 (26dBm±3dB) @ PCS1900 8-PSK
- Class 3 (24dBm+1/-3dB) @ WCDMA bands
- Class 3 (23dBm±2dB) @ LTE-FDD bands
- Class 3 (23dBm±2dB) @ LTE-TDD bands

#### Receiver Sensitivity :

- -96.3dBm (10M) @ LTE B1
- -94.3dBm (10M) @ LTE B2
- -93.3dBm (10M) @ LTE B3
- -96.3dBm (10M) @ LTE B4
- -94.3dBm (10M) @ LTE B5
- -94.3dBm (10M) @ LTE B7
- -93.3dBm (10M) @ LTE B8
- -93.3dBm (10M) @ LTE B12
- -93.3dBm (10M) @ LTE B13
- -96.3dBm (10M) @ LTE B18
- -96.3dBm (10M) @ LTE B19
- -93.3dBm (10M) @ LTE B20
- -92.8dBm (10M) @ LTE B25
- -93.8dBm (10M) @ LTE B26
- -94.8dBm (10M) @ LTE B28
- -96.3dBm (10M) @ LTE B38
- -96.3dBm (10M) @ LTE B39
- -96.3dBm (10M) @ LTE B40
- -94.3dBm (10M) @ LTE B41
- WCDMA B1: -106.7dBm
- WCDMA B2: -104.7dBm
- WCDMA B4: -106.7dBm
- WCDMA B5: -104.7dBm
- WCDMA B6: -106.7dBm
- WCDMA B8: -103.7dBm
- WCDMA B19: -106.7dBm
- GSM850: -102dBm
- GSM900: -102dBm
- DCS1800: -102dBm
- PCS1900: -102dBm

## MANAGEMENT

### Cloud Service

- DIACloud

### Software

- SSH, DNS, HTTP, TFTP, DHCP Server/Client, Syslog, NTP, MODBUS TCP, MODBUS ASCII/RTU, Mitsubishi MC, Siemens ISO-on-TCP

### Security

- MAC/IP/PORT filtering, SSH, SPI, Prevent denial of service (DoS) attacks

### Configuration

- Web Browser, DIACom, Android/iOS App

## POWER REQUIREMENTS

### Input Voltage

- 12 to 48V<sub>DC</sub>, 2 pin terminal block input

### Input Current

- Max. 1.4A

### Overload Current Protection

- Present, Max. Input current 2.5A

### Reverse Polarity Protection

- Present

## PHYSICAL

### Housing

- IP30 metal case

### Dimensions

- 145.3 mm (H) x 45 mm (W) x 115.7 mm (D)

### Weight

- 382g

### Installation

- Industrial DIN-Rail and Wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -20°C to 70°C (-4°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 61010
- IEC 62368-1

### EMI

- FCC 47 CFR Part 15 Subpart B Class A, IEC 61000-6-4, EN 55032, EN 55011, EN 301 489-1/52

### EMS

(EN 301 489-1/52, IEC 61000-6-2, EN 55024)

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

### RF

- EN 50385
- EN 301 511
- EN 301 908-1
- NCC
- RCM

### 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 Base-T(X)	RS-232	RS-485	DI	DO (Relay)	Power Input	Band	
DX-3021L9	-20°C to 70°C	5	1	1	2	2	1	Universal	Worldwide

NOTE. For available countries for purchase, please contact your regional sales or distributors.

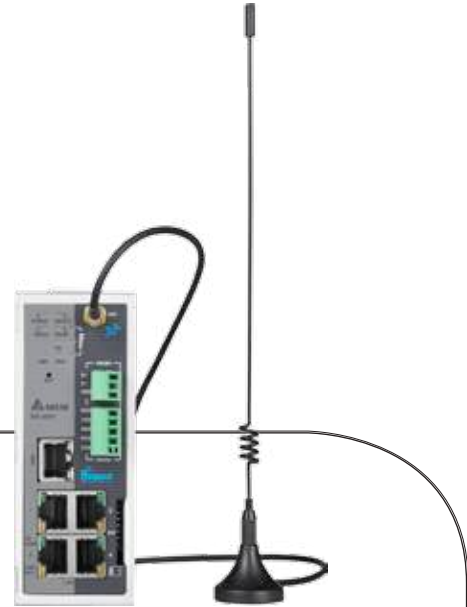
### Optional Products

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48 V<sub>DC</sub> Industrial Power Supply

# DX-3001H9 Series

## Industrial 3G/WAN DIACloud Cloud Routers



- ▶ A data acquisition device connected to cloud servers.  
Supports a two-way data collection channel between the device and the cloud
- ▶ Supports MODBUS TCP and MODBUS ASCII/RTU protocols
- ▶ Using UMTS/HSPA+ 3G technology, supports a wide range of bands (850 / 800, 900, AWS1700, 1900, 2100 MHz).  
Downward compatible with GSM/GPRS/EDGE 2G network
- ▶ Dual SIM redundancy design : seamless switch between two ISP systems for continuous online operation
- ▶ HSPA+ data transmission rate up to 21.6Mbps (downlink) / 5.76Mbps (uplink)
- ▶ Automatic APN parameter matching and connection redial
- ▶ Flexible connection method over WAN port, e.g. static IP, DHCP client and HTTP Proxy
- ▶ User configurable priorities of the connection to Internet over WAN and 2 cellular networks
- ▶ Various peripheral interfaces include RS-485, RS-232 and 4 LAN ports
- ▶ Built-in RTC and supports NTP time synchronization over a network
- ▶ Supports TCP/IP, UDP, ICMP, DHCP, HTTP, DNS and SSH protocols
- ▶ Device configurations import/export
- ▶ Network data flow statistics
- ▶ Device and PLC interlocking
- ▶ Networking failure diagnostics

## Specifications

### TECHNOLOGY

#### Standard Compliance

- GSM/GPRS/EDGE/UMTS/HSPA+
- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X)

# Specifications

## INTERFACE

### 3G

#### GSM/GPRS/EDGE/UMTS/HSPA+

##### Antennas:

- 1 2.5dBi omni-directional, SMA (male) connector, 3 meters cable with magnetic stand

#### Fast Ethernet

##### RJ45 Ports:

- WAN: 1 10/100Base-T(X), auto MDI/MDI-X, auto negotiation
- LAN: 4 10/100Base-T(X), auto MDI/MDI-X, auto negotiation

#### Serial Communication

##### Serial Ports :

- 1 RS-232 (5-pin Terminal block), 1 RS-485 (3-pin Terminal block), 15KV isolation protection

##### Baud Rate:

- 2400bps to 115200bps

##### Data Bits:

- 7, 8

##### Parity:

- None, Even, Odd

##### Stop Bits:

- 1, 2

##### Flow Control:

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

##### RS-232:

- TxD, RxD, RTS, CTS, GND

##### RS-485

- D+, D-, GND

#### LEDs

##### Device:

- POWER, READY, SIM1, SIM2, SD, Signal Strength

##### RJ45 Ports:

- 100M, LINK/ACT

##### Serial Ports:

- RS-232, RS-485

#### SIM Slot

- Number of SIMs: 2, Mini-SIM (25mm x 15mm)
- SIM Operating Voltage: 1.8V/3V

#### SD Socket

- SDHC(32mm x 24mm x 2.1mm), up to 32GB

#### Reset Button

- 1 set

### 3G RF

#### Frequency Band:

- UMTS/HSPA+: 800/850, 900, AWS1700, 1900, 2100 MHz
- GSM/GPRS/EDGE: 850, 900, 1800, 1900 MHz

#### Data Transmission Rates

##### HSPA+:

- Up link 5.76 Mbps
- Down link 21.6 Mbps

##### UMTS:

- Up link 384 kbps
- Down link 384 kbps

##### EDGE:

- Up link 236.8 kbps
- Down link 296 kbps

##### GPRS:

- Up link 85.6 kbps
- Down link 85.6 kbps

#### RF Output Power:

- Class 4 (2 W, 33 dBm) @GSM 850 / 900
- Class 1 (1 W, 30 dBm) @GSM 1800 / 1900
- Class 3 (0.25 W, 24 dBm) @UMTS
- Class E2 (0.5 W, 27 dBm) @EDGE 850 / 900
- Class E2 (0.4 W, 26 dBm) @EDGE 1800 / 1900

#### Receiver Sensitivity :

- -108 dBm @ UMTS
- -107 dBm @ GSM 850 / 900 MHz
- -106 dBm @ DCS1800 / PCS1900 MHz

## MANAGEMENT

#### Cloud Service

- DIACloud

#### Software

- SSH, DNS, HTTP, TFTP, DHCP Server/Client, Syslog, NTP, MODBUS RTU Master, SNMP Server

#### Security

- MAC/IP/URL filtering, SSH, SPI, Prevent denial of service (DoS) attacks, Port triggering, Port mapping

#### Configuration

- Web Browser, DIACom, Android/iOS App

## POWER REQUIREMENTS

#### Input Voltage

- 12 to 48V<sub>DC</sub>, 2 pin terminal block input

#### Input Current

- Max. 1A

#### Overload Current Protection

- Present, Max. Input current 1.5A

#### Reverse Polarity Protection

- Present

## PHYSICAL

### Housing

- IP30 metal case

### Dimensions

- 145.3 mm (H) x 45 mm (W) x 112.3 mm (D)

### Weight

- 372g

### Installation

- Industrial DIN-Rail and Wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -20°C to 70°C (-4°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 60950-1
- IEC 60950-1

### EMI

- FCC 47 CFR Part 15 Subpart B Class B
- EN 55022
- EN 55032
- EN 301 489-1/7/24

### EMS

(EN 301 489-1/7/24, EN 55024)

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

### RF

- EN 301 511, EN 301 908-1
- FCC Part 22H, 24E, 27

### 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			Region
Model Name	Operating Temperature	10/100 Base-T(X)	RS-232	RS-485	DI	DO (Relay)	Power Input	
DX-3001H9	-20°C to 70°C	5	1	1	---	---	1	China, EU, USA

### Optional Products

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48 V<sub>DC</sub> Industrial Power Supply

# DX-2100 Series

## Industrial 3G DIACloud Cloud Routers



-20~70°C



FANLESS



- ▶ Data acquisition equipment connected to cloud servers. Supports a two-way data collection channel between the device and the cloud
- ▶ Sets up a secure tunnel between the user and the remote device via the cloud server, without the need of additional VPN servers
- ▶ Supports MODBUS TCP, MODBUS ASCII/RTU and MC protocols
- ▶ Using UMTS/HSPA+ 3G technology, supports a wide range of bands (800/850, 900, AWS1700, 1900, 2100 MHz), downward compatible with GSM / GPRS / EDGE 2G network
- ▶ HSPA+ data transmission rate up to 21.6 Mbps (downlink)/ 5.76Mbps (uplink)
- ▶ Automatic APN parameter matching and connection redial
- ▶ Various peripheral interfaces include RS-485, RS-232 and LAN ports
- ▶ Built-in RTC and supports NTP time synchronization over a network
- ▶ Firewall functions: Stateful Packet Inspection (SPI), Prevent Denial of Service (DoS) attacks, NAT, port triggering, port mapping, IP address filtering, MAC address filtering, URL filtering
- ▶ Supports TCP/IP, UDP, ICMP, DHCP, HTTP, DNS and SSH protocols
- ▶ Scheduled jobs are available
- ▶ Device configurations import /export
- ▶ Network data flow statistics
- ▶ Networking failure diagnostics
- ▶ Device and PLC interlocking
- ▶ Custom alarm conditions with email alerts

## Specifications

### TECHNOLOGY

#### Standard Compliance

- GSM/GPRS/EDGE/UMTS/HSPA+
- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X)

### INTERFACE

#### 3G

GSM/GPRS/EDGE/UMTS/HSPA+

#### Antennas:

- 1 2.5dBi omni-directional, SMA(male) connector, 3 meters cable with magnetic stand

## INTERFACE

### Fast Ethernet

#### RJ45 Ports:

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

### Serial Communication

#### Serial Ports :

- 1 RS-232(DB9 male), 1 RS-485(DB9 female), 15KV isolation protection

#### Baud Rate:

- 2400bps to 115200bps

#### Data Bits:

- 7, 8

#### Parity:

- None, Even, Odd

#### Stop Bits:

- 1, 2

#### Flow Control:

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

#### RS-232:

- TxD, RxD, RTS, CTS, GND

#### RS-485

- D+, D-, GND

### LEDs

#### Device:

- PWR, SD, Ready, 3G, Signal Strength

#### RJ45 Ports:

- LAN

#### Serial Ports:

- RS-232 RX, RS-232 TX, RS-485 RX, RS-485 TX

### SIM Slot

- Number of SIMs: 1, Mini-SIM (25mm x 15mm)
- SIM Operating Voltage: 1.8V/3V

### SD Socket

- SDHC(32mm x 24mm x 2.1mm), up to 32GB

### Reset Button

- 1 set

## MANAGEMENT

### Cloud Service

- DIACloud

### Software

SSH, DNS, HTTP, TFTP, DHCP Server/Client, Telnet, Syslog, NTP, MODBUS TCP, MODBUS ASCII/RTU, MELSEC Communication

### Security

- MAC/IP/URL filtering, SSH, SPI, Prevent denial of service (DoS) attacks, Port triggering, Port mapping

### Virtual COM Drivers

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

### Configuration

- Web Browser, DIACom, Android/iOS App

## PHYSICAL

### Housing

- IP30 metal case

### Dimensions

- 111 mm(H) x 77 mm(W) x 26 mm (D)

### Weight

- 196g

### Installation

- Wall mounting

## 3G RF

### Frequency Band:

- UMTS/HSPA+: 800/850, 900, AWS1700, 1900, 2100 MHz
- UMTS/HSPA+ (CN model): 900, 2100 MHz
- GSM/GPRS/EDGE: 850, 900, 1800, 1900 MHz

### Data Transmission Rates

#### HSPA+:

- Up link 5.76 Mbps
- Down link 21.6 Mbps

#### UMTS:

- Up link 384 kbps
- Down link 384 kbps

#### EDGE:

- Up link 236.8 kbps
- Down link 296 kbps

#### GPRS:

- Up link 85.6 kbps
- Down link 85.6 kbps

#### RF Output Power:

- Class 4 (2 W, 33 dBm) @GSM 850 / 900
- Class 1 (1 W, 30 dBm) @GSM 1800 / 1900
- Class 3 (0.25 W, 24 dBm) @UMTS
- Class E2 (0.5 W, 27 dBm) @EDGE 850 / 900
- Class E2 (0.4 W, 26 dBm) @EDGE 1800 / 1900

#### RF Output Power(CN model):

- Class 4 (33 dBm, -2.5/+0.5dBm) @GSM 850 / 900
- Class 1 (30 dBm, -2.5/+0.5dBm) @GSM 1800 / 1900
- Class 3 (24 dBm, -2.5dBm) @UMTS 2100/900
- Class E2 (27 dBm, -2.5/+1.5dBm)
- Class E2 (0.4 W, 26 dBm)

#### Receiver Sensitivity :

- -108 dBm @ UMTS
- -107 dBm @ GSM 850 / 900 MHz
- -106 dBm @ DCS1800 / PCS1900 MHz

#### Receiver Sensitivity(CN model) :

- -109 dBm @ UMTS 2100 MHz
- -110 dBm @ UMTS 900 MHz
- -109.5 dBm @ GSM 850 MHz
- -109 dBm @ GSM 900 MHz
- -108 dBm @ DCS1800 / PCS1900 MHz

## POWER REQUIREMENTS

### Input Voltage

- 12 to 48V<sub>DC</sub>, 3 pin terminal block input

### Input Current

- Max 1A

### Overload Current Protection

- Present, Max. Input current 1.5A

### Reverse Polarity Protection

- NOT Present

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -20°C to 70°C (-4°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 60950-1, EN 60950-1 (DX-2100RW-WW certified)

### EMI

- FCC 47 CFR Part 15 Subpart B Class A
- EN 55022 (DX-2100RW-WW certified)
- EN 301 489-1/7/24 (DX-2100RW-WW certified)

### EMS

(EN 301 489-1/7/24, EN 55024)

- IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8 (DX-2100RW-WW certified)

### • RF

- EN 301 511, EN 301 908-1 (DX-2100RW-WW certified)
- FCC Part 22H, 24E, 27 (DX-2100RW-WW certified)

### 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			Region
Model Name	Operating Temperature	10/100 Base-T(X)	RS-232	RS-485	DI	DO (Relay)	Power Input	
DX-2100RW-CN	-20°C to 70°C	1	1	1	---	---	1	China
DX-2100RW-WW	-20°C to 70°C	1	1	1	---	---	1	EU, USA

### Optional Products

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48 V<sub>DC</sub> Industrial Power Supply

# DX-2300 Series

## Industrial Ethernet DIACloud Cloud Routers



- ▶ Data acquisition device connected to cloud servers. Supports a two-way data collection channel between the device and the cloud
  - ▶ Sets up a secure tunnel between the user and the remote device via the cloud server, without the need of additional VPN servers
  - ▶ Supports MODBUS TCP, MODBUS ASCII/RTU and MC protocols
  - ▶ Flexible connection method over WAN port, e.g. static IP, DHCP client and more
  - ▶ Various peripheral interfaces include RS-485, RS-232 and 4 LAN ports
  - ▶ Built-in RTC and supports NTP time synchronization over a network
  - ▶ Firewall functions: Stateful Packet Inspection (SPI), Prevent Denial of Service (DoS) attacks, NAT, port triggering, port mapping, IP address filtering, MAC address filtering, URL filtering
  - ▶ Supports TCP/IP, UDP, ICMP, DHCP, HTTP, DNS and SSH protocols
  - ▶ Scheduled jobs are available
- ▶ Device configurations import /export
  - ▶ Network data flow statistics
  - ▶ Networking failure diagnostics
  - ▶ Device and PLC interlocking
  - ▶ Custom alarm conditions with email alerts

## Specifications

### TECHNOLOGY

#### Standard Compliance

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

### INTERFACE

#### Fast Ethernet

##### RJ45 Ports:

- WAN: 1 10/100Base-T(X), auto MDI/MDI-X, auto negotiation
- LAN: 4 10/100Base-T(X), auto MDI/MDI-X, auto negotiation

# Specifications

## INTERFACE

### Serial Communication

#### Serial Ports :

- 1 RS-232(DB9 male), 1 RS-485 (Terminal block), 15KV isolation protection

#### Baud Rate:

- 2400bps to 115200bps

#### Data Bits:

- 7, 8

#### Parity:

- None, Even, Odd

#### Stop Bits:

- 1, 2

#### Flow Control:

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

#### RS-232:

- TxD, RxD, RTS, CTS, GND

#### RS-485

- D+, D-, GND

### LEDs

#### Device:

- PWR, SD, Ready

#### RJ45 Ports:

- 100M, LINK/ACT

#### Serial Ports:

- RS-232, RS-485

### Reset Button

- 1 set

## MANAGEMENT

### Cloud Service

- DIACloud

### Software

- SSH, DNS, HTTP, TFTP, DHCP Server/Client, Telnet, Syslog, NTP, MODBUS TCP, MODBUS ASCII/RTU, MELSEC Communication

### Security

- MAC/IP/URL filtering, SSH, SPI, Prevent denial of service (DoS) attacks, Port triggering, Port mapping

### Virtual COM Drivers

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

### Configuration

- Web Browser, DIACom, Android/iOS App

## POWER REQUIREMENTS

### Input Voltage

- 9 to 40V<sub>DC</sub>, 2 pin terminal block input

### Input Current

- Max. 0.53A

### Overload Current Protection

- Present, Max. Input current 1.5A

### Reverse Polarity Protection

- NOT Present

## PHYSICAL

### Housing

- IP30 metal case

### Dimensions

- 145.3 mm(H) x 45 mm(W) x 112.3 mm (D)

### Weight

- 308g

### Installation

- Industrial DIN-Rail and wall mounting

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -20°C to 70°C (-4°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 60950-1, EN 60950-1

### EMI

- FCC 47 CFR Part 15 Subpart B Class A
- EN 55022

### EMS (EN 55024)

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

### 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			Region
Model Name	Operating Temperature	10/100 Base-T(X)	RS-232	RS-485	DI	DO (Relay)	Power Input	
DX-2300LN-CN	-20°C to 70°C	5	1	1	---	---	1	China
DX-2300LN-WW	-20°C to 70°C	5	1	1	---	---	1	Worldwide

### Optional Products

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48 V<sub>DC</sub> Industrial Power Supply

# DX-3001H9-V Series

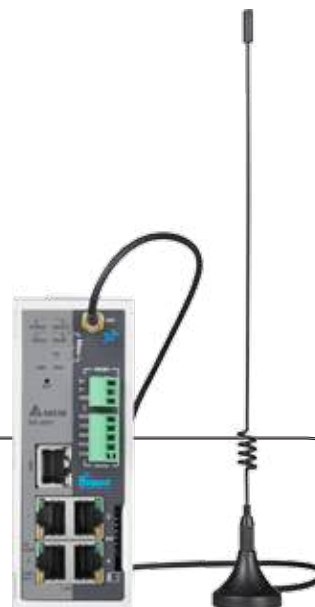
## Industrial 3G/WAN VPN Routers



-20~70°C



FANLESS



- ▶ Supports IPSec, OpenVPN, PPTP, L2TP and GRE standard VPN protocols, CA certificate in IPSec, L2TP over IPSec
- ▶ Using UMTS/HSPA+ 3G technology, supports a wide range of bands (850 / 800, 900, AWS1700, 1900, 2100 MHz). Downward compatible with GSM/GPRS/EDGE 2G network
- ▶ Dual SIM redundancy design: seamless switch between two ISP systems for online continuity
- ▶ HSPA+ data transmission rate up to 21.6Mbps (downlink) / 5.76Mbps (uplink)
- ▶ Automatic APN parameter matching and connection redial
- ▶ Flexible connection method over WAN port, e.g. static IP, DHCP client and more
- ▶ User configurable priorities of the connection to Internet over WAN and 2 cellular networks
- ▶ Various peripheral interfaces include RS-485, RS-232 and 4 LAN ports
- ▶ Built-in RTC and supports NTP time synchronization over a network
- ▶ Firewall functions: Stateful Packet Inspection (SPI), Prevent Denial of Service (DoS) attacks, NAT, port triggering, port mapping, IP address filtering, MAC address filtering, URL filtering
- ▶ Supports TCP/IP, UDP, ICMP, DHCP, HTTP, DNS and SSH protocols
- ▶ Device configurations import/export
- ▶ Network data flow statistics
- ▶ Networking failure diagnostics

## Specifications

### TECHNOLOGY

#### Standard Compliance

- GSM/GPRS/EDGE/UMTS/HSPA+
- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-T(X)

### INTERFACE

#### 3G

GSM/GPRS/EDGE/UMTS/HSPA+

#### Antennas:

- 1 2.5dBi omni-directional, SMA (male) connector, 3 meters cable with magnetic stand

# Specifications

## INTERFACE

### Fast Ethernet

#### RJ45 Ports:

- WAN: 1 10/100Base-T(X), auto MDI/MDI-X, auto negotiation
- LAN: 4 10/100Base-T(X), auto MDI/MDI-X, auto negotiation

### Serial Communication

#### Serial Ports :

- 1 RS-232 (5-pin Terminal block), 1 RS-485 (3-pin Terminal block), 15KV isolation protection

#### Baud Rate:

- 2400bps to 115200bps

#### Data Bits:

- 7, 8

#### Parity:

- None, Even, Odd

#### Stop Bits:

- 1, 2

#### Flow Control:

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

#### RS-232:

- Tx/D, Rx/D, RTS, CTS, GND

#### RS-485

- D+, D-, GND

### LEDs

#### Device:

- POWER, READY, SIM1, SIM2, SD, Signal Strength

#### RJ45 Ports:

- 100M, LINK/ACT

#### Serial Ports:

- RS-232, RS-485

### SIM Slot

- Number of SIMs: 2, Mini-SIM (25mm x 15mm)
- SIM Operating Voltage: 1.8V/3V

### SD Socket

- SDHC(32mm x 24mm x 2.1mm), up to 32GB

### Reset Button

- 1 set

### 3G RF

#### Frequency Band:

- UMTS/HSPA+: 800/850, 900, AWS1700, 1900, 2100 MHz
- GSM/GPRS/EDGE: 850, 900, 1800, 1900 MHz

### Data Transmission Rates

#### HSPA+:

- Up link 5.76 Mbps
- Down link 21.6 Mbps

#### UMTS:

- Up link 384 kbps
- Down link 384 kbps

#### EDGE:

- Up link 236.8 kbps
- Down link 296 kbps

#### GPRS:

- Up link 85.6 kbps
- Down link 85.6 kbps

#### RF Output Power:

- Class 4 (2 W, 33 dBm) @GSM 850 / 900
- Class 1 (1 W, 30 dBm) @GSM 1800 / 1900
- Class 3 (0.25 W, 24 dBm) @UMTS
- Class E2 (0.5 W, 27 dBm) @EDGE 850 / 900
- Class E2 (0.4 W, 26 dBm) @EDGE 1800 / 1900

#### Receiver Sensitivity :

- -108 dBm @ UMTS
- -107 dBm @ GSM 850 / 900 MHz
- -106 dBm @ DCS1800 / PCS1900 MHz

## MANAGEMENT

### VPN

- IPSec, OpenVPN, PPTP, L2TP, GRE

### Software

- SSH, DNS, HTTP, TFTP, DHCP Server/Client, Syslog, NTP, MODBUS RTU Master, SNMP Server

### Security

- MAC/IP/URL filtering, SSH, SPI, Prevent denial of service (DoS) attacks, Port triggering, Port mapping

### Configuration

- Web Browser

## PHYSICAL

### Housing

- IP30 metal case

### Dimensions

- 145.3 mm (H) x 45 mm (W) x 112.3 mm (D)

### Weight

- 372g

### Installation

- Industrial DIN-Rail and Wall mounting

## POWER REQUIREMENTS

### Input Voltage

- 12 to 48V<sub>DC</sub>, 2 pin terminal block input

### Input Current

- Max. 1A

### Overload Current Protection

- Present, Max. Input current 1.5A

### Reverse Polarity Protection

- Present

## ENVIRONMENTAL LIMITS

### Operating Temperature

- -20°C to 70°C (-4°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 60950-1
- IEC 60950-1

### EMI

- FCC 47 CFR Part 15 Subpart B Class B
- EN 55022
- EN 55032
- EN 301 489-1/7/24

### EMS

(EN 301 489-1/7/24, EN 55024)

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

### RF

- EN 301 511, EN 301 908-1
- FCC Part 22H, 24E, 27

### 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			Region
Model Name	Operating Temperature	10/100 Base-T(X)	RS-232	RS-485	DI	DO (Relay)	Power Input	
DX-3001H9-V	-20°C to 70°C	5	1	1	---	---	1	China, EU, USA

### Optional Products

DVP/CliQ/PMC Series: 12/24 V<sub>DC</sub> Industrial Power Supply

CliQII/PMC Series: 48 V<sub>DC</sub> Industrial Power Supply



# Global Operations

## ASIA (Taiwan)



Taoyuan Technology Center (Green Building)



Taoyuan Plant 1



Tainan Plant (Diamond-rated Green Building)



Wujiang Plant 3



Shanghai Office



### ASIA (Japan)



Tokyo Office



### ASIA (India)



Rudrapur Plant  
(Green Building)

### EUROPE



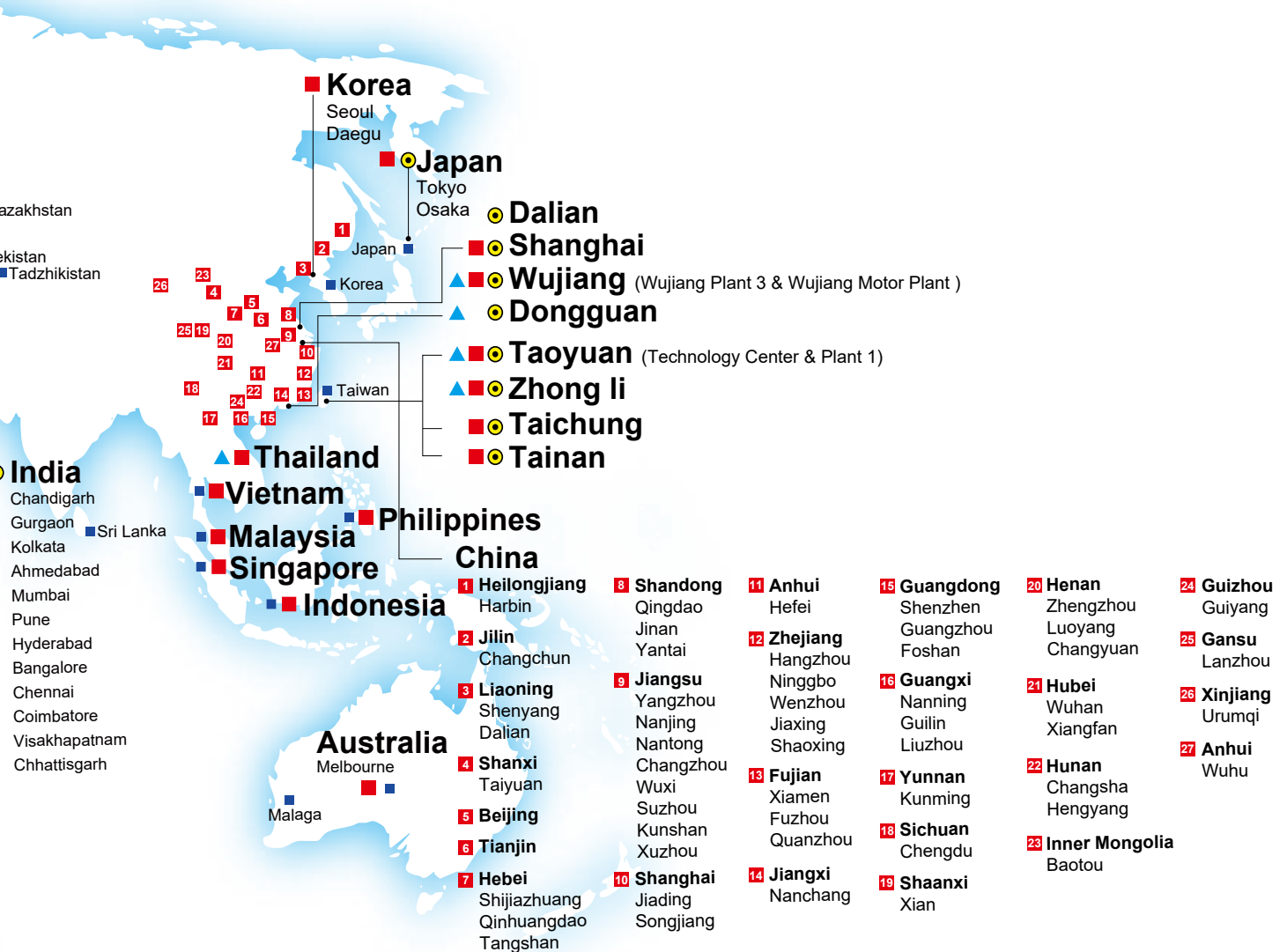
Amsterdam, the Netherlands

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Research Triangle Park, U.S.A.

▲ 6 Factories   ■ 117 Branch Offices   ● 13 R&D Centers   ■ 915 Distributors





Smarter. Greener. Together.

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