CopperWay-Bis-HV3

Secure Router for 20KV Substation with Pilot Cable & Fiber Connectivity

**20 KV
SUBSTATION**
Embedded
isolation

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CYBERSECURITY
IPSec
X.509 SCEP
Encryption
Authentication
HW security

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CONNECTIVITY
Pilot cables
Fiber optic
Ethernet
Digital I/O

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IEC-61850
Ruggedized

Introduction

The **CopperWay-Bis-*HV3*** is a fiber optic and copper Add-and-Drop Ethernet Access Device that delivers high speed Ethernet services on existing copper pairs and fiber optic infrastructure. The embedded 10 kV isolated interface makes it especially well suited for the 6 to 20 kV Utility Substation environments where it guarantees optimized provisioning, installation and lower CAPEX and OPEX as it leverages on existing pilot cables for Ethernet communications.

The **CopperWay-Bis-*HV3*** is a layer 3 router with extensive cybersecurity features to respond to the most stringent requirements of the electricity distribution networks. This includes IPSec tunnelling, X.509 authentication certificates with SCEP PKI enrolment protocol, firewall filtering. It embeds a Secure-Element for enhanced authentication certificate control, strong encryption of stored information and Secure-Boot to ensure total security of both data and software.

The **CopperWay-Bis-*HV3*** provides all interfaces and services requires in the substation. As Ethernet is used by many more equipment in the substation, CopperWay-Bis-HV3 delivers 6x RJ45 Ethernet ports and 2x gigabit Ethernet SFP sockets that can also be used as WAN interfaces when fiber optic cables are available. The CopperWay-Bis-HV3 offers also 1x Digital Input and 1x Relay Output to control simple devices or detector such as the substation door alarm contact to send an immediate alarm to the security control services.

The **CopperWay-Bis-*HV3*** embeds all IP protocols to fit in the latest network management and security architecture of Utility IT infrastructure. Such protocols include IPSec with IKEv2 and Hub-and-Spoke functions, SCEP, etc.

Applications

Electric Distribution Substation : communication network over pilot cables and fiber optic cables for all services of the utility substation.
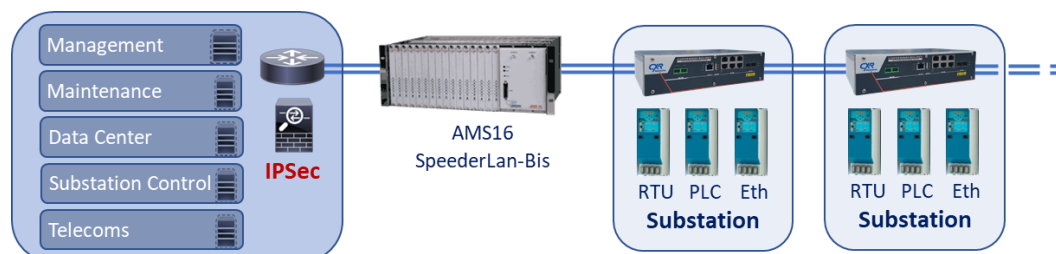
CopperWay-Bis-HV3 connects all the equipment of the 20 KV substation over a communication infrastructure made of pilot cables and fiber optic cables to the data center. It delivers many Ethernet ports to connect all substation systems. It embeds very strong security features to secure the substation communications including IPSec, X509 authentication and a hardware secure element.

Specifications

SHDSL interfaces

- 2x interfaces, East / West
- SHDSL.Bis : TC-PAM 16/32/64/128
- Throughput : Nx64kbps, 192 kbps to 15.4 Mbps
- Encapsulation EFM, 802.3ah
- Impedance 120 Ohms
- Isolation : 10 KV
- Hardware resiliency : by-pass relay
- Screw bloc

Ethernet interfaces

- 2x Gigabit Ethernet SFP sockets
- Choice of SFP modules MM 0.5/2km or SM 2~100km
- 6x 10/100BT interfaces, 802.3, RJ45
- Auto MDI/MDIX
- MAC address memory: 16 K
- Frame buffer memory: 2 Mb

Ethernet protocols

- Frame size : 1,524 bytes
- Resiliency : STP, RSTP, 802.1D
- Authentication : 802.1X
- VLAN : 802.1Q, per port
- QoS : 802.1p, VLAN/DSCP, rate limiting
- LLDP, 802.1ab

IP Protocols

- IP v4, v6
- Routing : static, GRE
- VPN : IPSec, Ike v2, Hub-and-Spoke, GRE
- DHCP, DNS

Digital Input and Relay Output

- 1x digital input
- 1x dry contact relay ouput : 48Vdc / 0.1A max
- Screw bloc

Management

- Interfaces: USB, IP
- Port USB M/S : CLI, web server, memory card for configuration backup and firmware updates, event log memory
- CLI: SSH
- Web server : http, Https
- SNMP : v1, v2, V3
- Radius: web and Ssh authentication
- LLDP
- SCEP : X509 certificate management
- Security : SecureBoot, secure element to provide strong encryption and integrity of stored information
- Diagnostics: Syslog, ping, tracert, interface and protocol diagnostics

General characteristics

- Robust metallic enclosure , DIN rail mounting
- Dimensions: 280x150x70 mm
- Weight : 1.3 kg
- Power supply: 2x inputs, 12-24 Vdc
- Max power consumption : 12 W
- Typical power consumption : 7W
- Operating temperature : -20 to +60 °C, fan-less
- Hygrometry : 0 to 90%, non-condensing
- Compliance : CE, EN-62368-1, EN-61000-6-2, EN-61000-6-4, IEC-61850-3
- MTBF : 242,000 Hours

Typical DSL performance on AWG26 / 0.4mm copper cable, no noise

Rate Mbps	0.192	1.280	2.048	4.6	5.7	11.4	15.3
Distance km	7	4.5	4	2.5	2	0.9	0.4

Ordering information

Reference	Description
CWAY-BIS-HV3	CopperWay-Bis-HV3 secure router
PROTEC-1DSL-RJ45	Lightning protection, 2x kits for each CopperWay
SFP-GSX-MM	Gigabit SFP module, Multi-Mode 850 nm, 500m, LC connector
SFP-GLX-SM20/40	GE SFP module, Single-Mode 1310 nm, 20 or 40 km, LC connector
SFP-GLX-SM80	GE SFP module, Single-Mode 1550 nm, 80 km, LC connector
PS-DIN-12V-40/75/120W	DIN power supply, 110-230 Vac to 12 Vdc, power 40, 75 or 120 W

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