# A CXR ETHERNET SWITCH FOR YOUR APPLICATION

Industrial and hardened switches
DIN-Rail, 19''rack or IP-67 enclosure
IEC61850-3 for Electrical Substation Automating System
EN50121-4 for Railway Station
EN50155 & EN50121-3-2 for Rolling Stock & Railway Networks
IEC61000 & Nema TS1/TS2 for Intelligent Traffic System
Hybrid Ethernet with G.Shdsl, fiber & RS232/RS485
Layer 3 switches FE/GE/10GE for Backbone Infrastructures
POE Ethernet IEEE802.3af/3at
SyncE & PTP IEEE 1588V2

www.cxr.com

*Smart solutions for smart networks*

# How to select the CXR switch order numbers

**SSSS-qq-naa-nbb-ncc-pw-ffff**

| | | | | | |
|---|---|---|---|---|---|
| **SSSS** | **Generic name of the switch** | | | | |
| **SW-** | 19" 1U format | Unmanageable | | | |
| **SWM-** | 19" 1U format | Layer 2 | | | |
| **SW3-** | 19" 1U format | Layer 3 | | | |
| **SWD-** | DIN-Rail enclosure | Unmanageable | | | |
| **SWMD-** | DIN-Rail enclosure | Layer 2 | | | |
| **SWP-** | Industrial enclosure with panel fixing | Unmanageable | | | |
| **SWMP-** | Industrial enclosure with panel fixing | Layer 2 | | | |
| **HSW-** | Plastic box with fiber tray and wall fixing | Unmanageable | | for FTTh | |
| **HSWM-** | Plastic box with fiber tray and wall fixing | Layer 2 | | for FTTh | |
| **qq** | **Quality and compliance** | | **EMC** | **Railway** | **Electrical substation** |
| **[ ]** | Entreprise switch | 0 to 50°C | CE | - | - |
| **I** | Industrial switch | -10 to +60°C | IEC61000-6-2 | - | - |
| **H** | Hardened switch | - 40 to +75°C | IEC61000-6-2 | - | - |
| **HT** | Hardened switch for railway station | - 40 to +75°C | IEC61000-6-2 | EN50121-4 | - |
| **HE** | Hardened switch for electrical substation | - 40 to +75°C | IEC61000-6-2 | EN50121-4 | IEC61850-3, IEEE1613 |
| **HR** | Hardened switch used on railway rolling stock | - 40 to +75°C | IEC61000-6-2 | EN50155 , EN50121-3-2 | |
| **Hx67** | Hardened switch in IP-67 enclosure | - 40 to +75°C | | | |
| **naa-nbb-ncc** | **number of port, type:** | | | | |
| **TX** | 10/100BaseT | | | | |
| **GX** | 1000BaseT | | | | |
| **TGX** | 10/100/1000BaseT | | | | |
| **FM** | 100FX multimode | | | | |
| **FS20** | 100FX singlemode 20 km | | | | |
| **FSF** | Slot for SFP 100FX *(always delivered w/o SFP module)* | | | | |
| **GS** | 1000SX multimode | | | | |
| **GL20** | 1000LX singlemode 1310nm | | | | |
| **GZ20** | 1000ZX singlemode 1550nm | | | | |
| **GSF** | Slot for SFP 1000SX/LX/ZX *(always delivered w/o SFP module)* | | | | |
| **USF** | Slot for universal SFP 100FX or 1000SX/LX/ZX *(always delivered w/o SFP module)* | | | | |
| **CB** | Combo w 10/100/1000BaseT and SFP 1000SX/LX/ZX slot (only one port is active at the same time) | | | | |
| **UCBO** | Universal Combo w 10/100/1000BaseT and dual rate SFP 100FX / 1000SX/LX/ZX slot (only one port is active at the same time) | | | | |
| **TM** | 10/100BaseT with M12 connector | | | | |
| **GM** | 10/100/1000BaseT with M12 connector | | | | |
| **XFP** | Slot for XFP 10GE module LS/LR/ER/ZR *(always delivered w/o XFP module)* | | | | |
| **SFPP** | Slot for SFP+ 10GE module LS/LR/ER/ZR *(always delivered w/o SFP+ module)* | | | | |
| **TPS** | 100BaseT POE PSE (source) IEEE802,3af or 3at | | | | |
| **TPD** | 100BaseT POE PD (Powered devices) | | | | |
| **GPS** | 1000BaseT PSE POE (source) IEEE802,3af or 3at | | | | |
| **pw** | **power supply** | | | | |
| **[ ]** | Entreprise switch is delivered with AC | | | | |
| **[ ]** | DIN-Rail switches are mainly delivered w 3 power supply inputs: 12-48Vdc dual terminal block and 12Vdc self-blocking jack. | | | | |
| **1A** | One AC (110V/220V) | | | | |
| **1D8** | One DC 48V | | | | |
| **2A** | Two redundant AC (110V/220V) | | | | |
| **2D8** | Two redundant DC 48V | | | | |
| **ffff** | **additional number order** | | | | |

# Industrial and Hardened Ethernet Switches FE/GE/10GE

*CXR offers a large range of Fast-Ethernet/Gigabit-Ethernet industrial and hardened switches for Intelligent Transportation System (ITS) compliant to Nema TS1/TS2, but also for Railway environment according to EN50121-4 and for Electrical Power Substation Automation System according to IEC61850-3. These equipments are used in Building Automation and Factory Automation. CXR proposes also a range of Carrier Ethernet Switches FE/GE/10GE to build backbones.*

*Industrial -10 to +60° C* | *Hardened -40 to +75° C*

*IEC 61000-6-2 ITS Intelligent Transportation System - Building Automation - Factory Automation —*

*EN50121-4 Railway IEC61850-3 Electrical Power substation automation*

## Unmanaged Switches, DIN-Rail

SWD-I-5TX

SWD-I-8TX-xF

SWD-H-8TX-xF

SWD-H-16TX-xF

SWD-HE-8TX-xF

*DIN-Rail Switches with dual 12-48Vcc and 12Vcc jack power supply. Inputs support 6kV electric shocks and 5g at 10-150KHz of 0,35mm vibrations.*

**SWD-I-5TX / SWD-I-4TX-F...**
4 to 5x10/100BaseT, 0 or 1x100FX.

**SWD-I-8TX-xF… SWD-H-8TX-xF…**
6 to 8x10/100BaseT, 0, 1 or 2x100FX.

**SWD-H-8TX-xF...**
6 to 8 x10/100BaseT, 0,1 or 2x100FX.

**SWD-H-16TX-xF...**
14 to 16x10/100BaseT, 0,1 or 2x100FX.

**SWD-HE-8TX-xF...**
EN50121-4 and IEC61850-3
Railway and Power substation Automation

## Layer 2 Managed Switches, DIN-Rail & 19”

SWMD-I-8TX

SWMD-I-16TX

SWMD-H-16TX

SWMD-HT-8TX

SWMD-HE-16TX

*Support 802.1x Authentification , VLAN 802.1q, QoS 802.1p, RSTP, MSTP, Alpha -Ring <15ms, Truncking, IGMP...*

**SWMD-I-8TX and -2FSF-2GSF**
8x10/100BaseT, 2 up-link 1000BaseT
SFP 100FX and/or SFP 1000FX

**SWMD-I-16TX and -2GS..**
**SWMD-H-16TX and -2FSF,-2GSF**
16x10/100BaseT, 2 up-link 1000BaseT
SFP 100FX and/or SFP 1000FX

**SWMD-HT-8TX and 2FSF-2GSF**
EN50121-4 Railway Station
8x10/100BaseT, 2 up-link 1000BaseT
SFP 100FX and/or SFP 1000FX

SWM-HE-24TX
SWM-HE-24FX

**SWMD-I-8TGX,-2G…**
8x10/100/1000BaseT, 2 fixed 1000FX

SWMD-I-8TGX

SWM-H-24TX-4CB
SWM-H-24FX-4CB

**SWM-H-24TX,-4GX or 4 Combo**
24x10/100BaseT, 4 up-link 1000BaseT
or Combo 100/1000BaseT SFP 1000FX

SWM-HE-M modular

**SWM-HE-24TX,-4GX or 4 Combo**
EN50121-4 and IEC61850-3, Railway and Power Substation automation

**SWM-HE-M**
Modular switch 24 FE/FX and 4 GE/GX

SWMP-HR67

**SWMP-HR67**
IP-67 switch EN50155 Rolling Stock

## Layer 2 Managed Hybrid Ethernet/DSL/FO & RS232/485

CopperWAY-BIS

*Hybrid Ethernet FE, FX & G.SHDSL.Bis, switch with encapsulation over TCP/ UDP of RS232/RS485, dry contact ...*

**CopperWAY-BIS-2/4W-4RS...**
4x10/100Baset, 2 SFP 100FX, 2 GSHDSL.bis 2/4 wires, 4 RS232, contact

## Layer 2 & 3 Managed Carrier Ethernet GE/10GE

SWM-8TX-UCB

SWM-24TX-2UCB

SW3L-24/48TX/FX

SW3G-24/48TX/FX

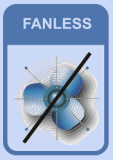
*Support 802.1x, VLAN 802.1q, Q-in-Q, QoS 802.1p, RSTP, MSTP, ESR-Ring <50ms, G8032, Truncking, IGMP… VLAN routing, RIP1&2, OSPF, VRRP...*

**SWM-8/24TX-2UCB-AC or DC**
8 or 24x10/100Baset, 2 universal Combo

**SW3l-24/48TX/FS-4GE...**
Layer 2+, 24 or 48 ports FE/FX, 4 Combo

**SW3G-20/44TGX-4GE...**
Layer 3, 20 or 48 ports GE/GX, 4 Combo, 4 x 10GE

# DIN-rail Industrial and Hardened Unmanaged Ethernet switches




| MODELS | SWD-I-5TX<br>SWD-I-4TX-F.. | SWD-I-8TX<br>SWD-I-8TX-F..<br>SWD-I-6TX-2F.. | SWD-H-8TX<br>SWD-H-8TX-F.. | SWD-HE-8TX<br>SWD-HE-6TX-F..<br>SWD-HE-6TX-2.. | SWD-H-16TX<br>SWD-H-14TX-2F..<br>SWD-H-15TX-F.. |
|---|---|---|---|---|---|
| MANAGEMENT | Unmanaged | | | | |
| Maximum Number of ports | 5 FE | 9 FE | 9 FE | 8 FE | 16 FE |
| *Environment* | | | | | |
| Industrial -10 to 60°C | √ | √ | | | |
| Hardened -40 to 75°C | | | √ | √ | √ |
| Industrial | IEC61000-6-2 EMC Generic Standard immunity for Industrial env., CE, FCC, UL608, NEMA TS1 & TS2 | | | | |
| Train station | | | | EN50121-4 | |
| Power substation automation | | | | IEC61850-3 | |
| *Ethernet ports* | | | | | |
| User ports | 5 or 4<br>10/100BaseT | 8 ou 6<br>10/100BaseT | 8<br>10/100BaseT | 8 or 6<br>10/100BaseT | 16, 15 or 14<br>10/100BaseT |
| Optical fiber 100FX | 0 or 1 | 0, 1 or 2 | 0, 1 or 2 | 0, 1 or 2 | 0, 1 or 2 |
| Uplink 10/100/1000BaseT | | | | | |
| Uplink 1000FX | | | | | |
| Optical | MM or SM10/20 | MM or SM10/20 | MM or SM10/20 | MM or SM10/20 | MM or SM10/20 |
| Alarm contact | - | Yes | Yes | Yes | Yes |
| *Mechanical/Electrical* | | | | | |
| Format | IP30 aluminium case<br>DIN-Rail<br>Fanless | IP30 aluminium case<br>DIN-Rail<br>Fanless | IP30 aluminium case<br>DIN-Rail<br>Fanless | IP30 aluminium case<br>DIN-Rail<br>Fanless | IP30 aluminium case<br>DIN-Rail<br>Fanless |
| Dimensions L x D x H mm | 75,5 x 110 x 135 | 50 x 125 x 135 | 50 x 110 x 135 | 60 x 125 x 145 | 75,5 x 110 x 135 |
| Power supply | 12-48Vcc | 2 x 12-30Vcc<br>jack 12Vcc | 2 x 12-48Vcc<br>jack 12Vcc | 2 x 12-48Vcc<br>jack 12Vcc | 2 x 12-48Vcc<br>jack 12Vcc |
| *Performance* | | | | | |
| Address table size | 2048 | 2048 | 2048 | 2048 | 4096 |
| Packet Buffer Memory/bits | 384K | 768K | 768K | 448K | 1,6M |

## PHYSICAL DESCRIPTION OF INDUSTRIAL DEVICES & COMPLIANCES

**INDUSTRIAL** Working temperature is -10 or -20°C to 60°C, during the manufacturing process each product is tested from -20 to +70°C temperatures during 72 hours. Comply to CE, EMI/EMS EN61000-6-2/4 and FCC Part 15 Class A, Vibration/Chock IEC60068-2-6/32

**HARDENED** Working temperature is 40°C to 75°C, during the manufacturing process each product is tested from -40 to +85°C temperatures during 72 hours. Comply to CE, EMI/EMS EN61000-6-2/4 and FCC Part 15 Class A, Vibration/Chock IEC60068-2-6/32

**EN50121-4** These equipments comply to the environmental/electrical regulations applicable for railway stations.

**EN50155 , EN50121-3-2** These equipments comply to the environmental/electrical/vibration regulations applicable for railway rolling stock. They are using M12 Ethernet connectors.

**IEC61850-3 & IEEE1613** These equipments comply to the environment/electrical standard for the Electrical Power Substation Automation.

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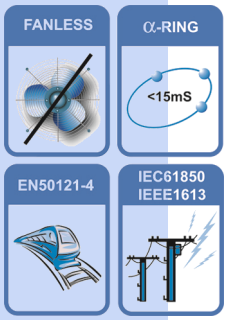
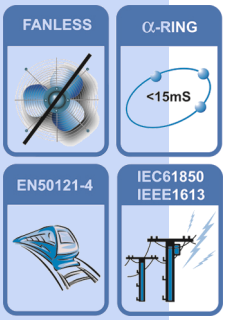
# DIN-rail Industrial and Hardened Layer 2 managed Ethernet switches




- Full Ethernet Layer2 stacks with high level access security
- Alpha ring recovery < 15ms and dual homing MSTP/RSTP
- Dual power input -12 to - 48Vdc terminal block and 12Vdc jack with latch
- IP30 aluminum case with DIN-rail fixing according to IEC60068

| MODELS | SWMD-I-8TX-2TGX<br>SWMD-I-8TX-2GSF<br>SWMD-I-6TX-2FSF2GSF | SWMD-HT-8TX-2TGX<br>SWMD-HT-8TX-2GSF<br>SWMD-HT-6TX-2FSF2GSF | SWMD-I-16TX-T2GX<br>SWMD-I-16TX-2G.. | SWMD-H-16TX<br>SWMD-H-16TX-2G.. | SWMD-HE-16TX<br>SWMD-HE-16TX-2G.. | SWMD-I-8TGX<br>SWMD-I-6TGX-2G..<br>SWMD-I-7TGX-G.. |
|---|---|---|---|---|---|---|
| MANAGEMENT | Layer 2 managed | | | | | |
| *Environment* | | | | | | |
| Industrial -10 to 60°C<br>factory test at 70°C during 72h | √ | | √ | | | |
| Hardened -40 to 75°C<br>factory test at 85°C during 72h | | √ | | √ | | √ |
| Industrial | IEC61000-6-2 EMC Generic Standard immunity for Industrial env., CE, FCC, UL608, NEMA TS1 & TS2 | | | | | |
| Railwail station | | EN50121-4 | | | EN50121-4 | |
| Power substation automation | | | | | IEC61850-3 | |
| *Ethernet ports* | | | | | | |
| Maximum throughput | 8 FE + 2 GE | 8 FE + 2 GE | 16 FE + 2 GE | 16 FE + 2 GE | 16 FE + 2 GE | 8 GE |
| User ports | 8 x 10/100BaseT or<br>6 x 10/100BaseT &<br>2 x 100FX SFP | 8 x 10/100BaseT or<br>6 x 10/100BaseT &<br>2 x 100FX SFP | 16<br>10/100BaseT | 16<br>10/100BaseT | 16<br>10/100BaseT | 8, 7 or 6<br>10/100/1000BaseT |
| 100FX fiber ports | | | | | | |
| 10/100/1000BaseT uplink | 2 x 10/100/1000BaseT or | 2 x 10/100/1000BaseT or | 0 or 2 | 0 or 2 | 0 or 2 | |
| 1000FX uplink | 0 or 2 SFP | 0 or 2 SFP | 0 or 2 | 0 or 2 | 0 or 2 | 0 or 2 |
| Optical | SFP FX or GSX/GLX | SFP FX or GSX/GLX | MM or SM10/20 | MM or SM10/20 | MM or SM10/20 | MM or SM10/20 |
| *Mechanical/Electrical* | | | | | | |
| Format | IP30 aluminium case<br>DIN-Rail<br>Fanless | IP30 aluminium case<br>DIN-Rail<br>Fanless | IP30 aluminium case<br>DIN-Rail<br>Fanless | IP30 aluminium case<br>DIN-Rail<br>Fanless | IP30 aluminium case<br>DIN-Rail<br>Fanless | IP30 aluminium case<br>DIN-Rail<br>Fanless |
| Dimensions L x P x H | 60 x 125 x 145 | 60 x 125 x 145 | 59 x 125 x 145 | 65 x 125 x 145 | 84 x 125 x 145 | 60 x 125 x 145 |
| Power supply | 2 x 12-48Vcc<br>jack 12Vcc | 2 x 12-48Vcc<br>jack 12Vcc | 2 x 12-48Vcc<br>jack 12Vcc | 2 x 12-48Vcc<br>jack 12Vcc | 2 x 12-48Vcc<br>jack 12Vcc | 2 x 12-32Vcc<br>jack 12Vcc |
| *Performance* | | | | | | |
| Mac address table size | 4096 | 8192 | 8192 | 8192 | 8192 | 4096 |
| Packet Buffer Memory/bits | 2M | 2M | 2M | 2M | 2M | 1M |
| *Network redundancy & ring* | | | | | | |
| STP/RSTP | Yes | | | | | |
| MSTP | Yes | | | | | |
| Alpha Ring < 15ms | Yes | | | | | |
| *Management and network's protocols* | | | | | | |
| VLAN | VLAN per port and tagging 802.1q and GVRP | | | | | |
| QoS 802.1p | 802.1p with 4 priority queues | | | | | |
| IGMP | Multicast with IGMP Snooping V1,V2 and V3 | | | | | |
| Security of access | 802.1x per port with Radius client, and per port up to 24 static Secure MAC adresses | | | | | |
| Bandwidth Rate Control | 802.3x ingress/egress flow control per port | | | | | |
| Other protocols | Truncking LACP, Port Mirroring, NTP client and NTP relay | | | | | |
| Ethernet | 10/100Mbps Full/Half Duplex, 1000Mbps Full Duplex, Auto-negotiation, MDI/MDIX, tranfert Wire-Speed, | | | | | |
| Management | Consol port, Telnet/SSH, SNMP V1/V2/V3, RMON, Web browser, TFTP and CLI, Client and Server DHCP | | | | | |

# 19” 1U Industrial & Hardened Layer 2 managed Ethernet switches




- Full Ethernet Layer2 stacks with high level access security
- Alpha ring recovery < 15ms and dual homing MSTP/RSTP

- Hardened switch, half 19” with bracket for panel or 19” mounting
- 12 FE and 2 GSX/GLX SFP uplink
- Dual DC 48V power supplies

- Multiple fixed configurations on order up to 24 FE or FX SFP with 4 GE combo
- Compliance with the regulations in :
  Intelligent traffic
  Railway Stations
  Electric Power Substation Automatic System
- Support -40°C to +75°C tested at 85°
- Single or double AC or DC 48V power supplies

| MODELS | SWM-H-14TX<br>SWM-H-12TX-2G.. | SWM-H-24TX-4GX<br>SWM-H-24TX-4CB | SWM-H-24FSF-4GX<br>SWM-H-24FSF-4CB | SWM-HE-24TX-4GX<br>SWM-HE-24TX-4CB | SWM-HE-24FSF-4CB<br>....-16TX-8FSF-4CB |
|---|---|---|---|---|---|
| MANAGEMENT | Layer 2 managed | | | | |
| *Environment* | | | | | |
| Industrial -10 to 60°C<br>factory test at 70°C during 72h | | | | | |
| Hardened -40 to 75°C<br>factory test at 85°C during 72h | √ | √ | √ | √ | √ |
| Industrial | IEC61000-6-2 EMC Generic Standard immunity for Industrial env., CE, FCC, UL608, NEMA TS1 & TS2 | | | | |
| Railwail station | | | | EN50121-4 | |
| Power substation automation | | | | IEC61850-3 | |
| *Ethernet ports* | | | | | |
| Maximum throughput | 12 FE + 2 GE | 24 FE + 4 GE | 24 FX + 4 GE | 24 FE + 4 GE | 24 FX + 4 GE |
| User ports | 14 or 12<br>10/100BaseT | 24<br>10/100BaseT | 24 or 16<br>100FX SFP | 24<br>10/100BaseT | 24<br>100FX SFP |
| 100FX fiber ports | | | | | |
| 10/100/1000BaseT uplink | 0 or 2 | 4 or | | 4 or | 4 Combo |
| 1000FX uplink | 0 ou 2 SFP | 4 Combo | 4 Combo | 4 Combo | 10/100/1000BaseT |
| Optical | SFP 1000SX/LX/ZX | SFP 1000SX/LX/ZX | SFP 1000SX/LX/ZX | SFP 1000SX/LX/ZX | SFP 1000SX/LX/ZX |
| *Mechanical/Electrical* | | | | | |
| Format | IP30 metal case<br>Optional Rail-DIN or 19" 1,25 U,<br>Fanless | IP30 metal case<br>19" 1U<br>Fanless | | IP30 metal case<br>19" 1U<br>Fanless | |
| Dimensions L x P x H | 235 x 125 x 50 | 442 x 250 x 44 single power<br>442 x 375 x 44 dual power | | 442 x 284 x 44 single power<br>442 x 375 x 44 dual power | |
| Power supply | 2 x 12-48Vcc<br>jack 12Vcc | AC, 2 AC,<br>DC48v ou 2DC48v | | AC, 2 AC,<br>DC48v ou 2DC48v | |
| *Performance* | | | | | |
| Mac address table size | 8192 | 8192 | | 8192 | |
| Packet Buffer Memory/bits | 3M | 3M | | 3M | |
| *Network redundancy & ring* | | | | | |
| STP/RSTP | Yes | Yes | | Yes | |
| MSTP | Yes | Yes | | Yes | |
| Alpha Ring < 15ms | Yes | Yes | | Yes | |
| *Management and network's protocols* | | | | | |
| VLAN | VLAN per port and tagged 802.1q, GVRP | | | | |
| QoS 802.1p | 802.1p with 4 priority queues | | | | |
| IGMP | Multicast w IGMP Snooping V1,V2 et V3 | | | | |
| Security of access | 802.1x per port with Radius client, and per port up to 24 static Secure MAC addresses | | | | |
| Bandwidth Rate Control | 802.3x administration for ingress/egress flow per port | | | | |
| Other protocols | Truncking/MAC address, Port Mirroring, NTP client and relay | | | | |
| Ethernet | 10/100Mbps Full/Half Duplex, 1000Mbps Full Duplex, Auto-negotiation, MDI/MDIX, tranfert Wire-Speed, | | | | |
| Management | Console port, Telnet/SSH, SNMP V1/V2/V3, RMON, Web browser, TFTP and CLI, Client and Server DHCP | | | | |

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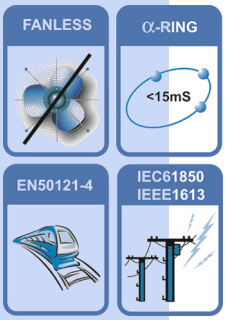
# Modular 19’’ 1U Hardened & Industrial Layer 2 managed Ethernet switches




| MODELS | SWM-IE-M plus modules | SWM-HE-M plus modules |
|---|---|---|
| MANAGEMENT | Layer 2 manageable | |
| *Environment* | | |
| Industrial -10 to 60°C factory test at 70°C during 72h | √ | |
| Hardened -40 to 75°C factory test at 85°C during 72h | | √ |
| Industrial | IEC61000-6-2 EMC Generic Standard immunity for Industrial env., CE, FCC, UL608, NEMA TS1 & TS2 | |
| Railwail station | EN50121-4 | |
| Power substation automation | IEC61850-3 | |
| *Ethernet ports* | | |
| Maximum throughput | 24 FE/FX + 4 GE | |
| User ports 10/100BaseT or 100FX | 3 slots with a choice of 3 modules: 8 x 10/100BaseT 6 x 100FX fixed MM or SM 6 FE + 2 FX fixed M or SM | |
| Uplink ports 4 GE or 4 GSX/GLX | 1 slot with a choice of 2 modules: 4 x 10/100/1000BaseT 4 Combo 100/1000Baset and GSX/GLX SFP | |
| *Mechanical/Electrical* | | |
| Format | IP30 metal case 19" 1U Fanless | IP30 metal case 19" 1U Fanless |
| Dimensions L x P x H | 442 x 343 x 44 mm | 442 x 343 x 44 single power 442 x 375 x 44 dual power |
| Power supply | AC or DC48v | AC, 2 AC, DC48v or 2DC48v |
| *Performance* | | |
| Mac address table size | 8192 | 8192 |
| Packet Buffer Memory/bits | 3M | 3M |
| *Network redundancy & ring* | | |
| STP/RSTP | Yes | Yes |
| MSTP | Yes | Yes |
| Alpha Ring < 15ms | Yes | Yes |
| *Management and network's protocols* | | |
| VLAN | VLAN per port and tagged 802.1q, GVRP | |
| QoS 802.1p | 802.1p with 4 priority queues | |
| IGMP | Multicast w IGMP Snooping V1,V2 et V3 | |
| Security of access | er port with Radius client, and per port up to 24 static Secure MAC a | |
| Bandwidth Rate Control | 802.3x administration for ingress/egress flow per port | |
| Other protocols | Truncking/MAC address, Port Mirroring, NTP client and relay | |
| Ethernet | Half Duplex, 1000Mbps Full Duplex, Auto-negotiation, MDI/MDIX, tra | |
| Management | Console port, Telnet/SSH, SNMP V1/V2/V3, RMON, Web browser, TFTP and CLI, Client and Server DHCP | |

- Fully modular range of switches supporting up to 24 FE/FX and 4 Combo
- Full Ethernet Layer2 stacks with high level access security
- VLAN, QoS with 4 queues, IGMP snooping...
- Alpha ring recovery < 15ms and dual homing MSTP/RSTP

Compliance with regulations for:

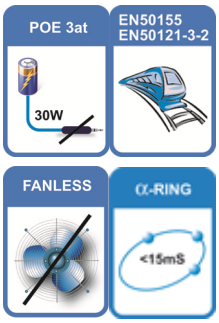
- ITS ‘’Intelligent traffic system’’ according to EN61000
- Railway-Tramway-Underground Stations according to EN50121-4
- Automatic system in electrical substations according to IEC61850/IEEE1613

- Support -40°C to +75°C and tested during the manufacturing process at 85°C
- Uplink module (1 slot):
  - 4 x 10/100/1000BaseT ports
  - 4 ports Combo 10/100/1000BaseT and 1000FX SFP
- Tributaries modules :
  - 8 ports 10/100BaseT
  - 6 ports 100FX fibre fixe
  - 6 ports 100FX fibre fixe et 2 10/100BaseT
- Single or dual AC or DC 48V power supplies
- SWM-IE-M version supports -20 to +60°C
- SWM-HE-M version supports -40 to +75°C

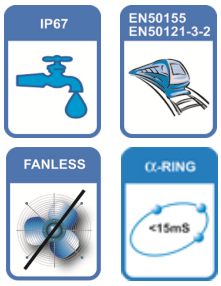
# Layer 2 Ethernet switches for Railway Rolling stock Material EN50155 and IP67

*CXR supplies Ethernet copper extenders and Ethernet switches design to be mounted inside the rolling stock material: railway, tramway or underground. These equipments are compliant with the EN50155 and EN50121-4 and support high level of EMC and vibration constraints. Extenders use twisted pair or coax in VDSL or MSDSL to connect switches and carry voice, video, data and power-feed Wifi AP.*

| MODELS | SWMP-HR-8TPM-2GM | SWMP-H67-8TM8TPM-2GM |
|---|---|---|
| MANAGEMENT | Layer 2 managed | |
| *Environment* | | |
| Hardened -40 to 75°C factory test at 85°C during 72h | √ | √ |
| Industrial | IEC61000-6-2 EMC Generic Standard immunity for Industrial env., CE, FCC, UL608, NEMA TS1 & TS2 | |
| Railwail station | EN50155 EN50121-3-2 | EN50155 EN50121-3-2 |
| *Ethernet ports* | | |
| Maximum throughput | 8 FE + 2 GE | 16 FE + 2 GE |
| User ports | 8 x 10/100BaseT with M12 connector | 16 x 10/100BaseT with M12 connector |
| 10/100BaseT POE PsE 802.3at | 8 ports at 30W | 8 POE 802.3at 30W ports & 8 ports non poe |
| 10/100/1000BaseT uplink | 2 x 10/100/1000BaseT or 2 x 1000GSX or GLX in LC, w M12 connector | 2 x 10/100/1000BaseT or 2 x 1000GSX or GLX in LC, w M12 connector |
| 1000FX uplink | | |
| Alarm contact | Yes - setup for power and port link failure | |
| *Mechanical/Electrical* | | |
| Format | IP50 metal case, panel mounting, Fanless | IP67 metal case, panel mounting, Fanless |
| Dimensions L x P x H mm | 288 x 161,5 x 64 | 258 x 83,5 x 228 |
| Power supply | 2 x 24-48Vcc with M23 connector | 2 x 12-48Vcc ou 2 x AC, with M23 connector |
| *Performance* | | |
| Mac address table size | 8192 | 8192 |
| Packet Buffer Memory/bits | 2M | 2M |
| *Network redundancy & ring* | | |
| STP/RSTP/MSTP | Yes | |
| Alpha Ring < 15ms | Yes | |
| *Management and network's protocols* | | |
| VLAN | VLAN per port and tagging 802.1q and GVRP | |
| QoS 802.1p | 802.1p with 4 priority queues | |
| IGMP | Multicast with IGMP Snooping V1,V2 and V3 | |
| Security of access | 802.1x per port with Radius client, per port 24 static Secure MAC adresses | |
| Bandwidth Rate Control | 802.3x ingress/egress flow control per port | |
| Other protocols | Truncking LACP, Port Mirroring, NTP client and NTP relay | |
| Ethernet | 10/100Mbps Full/Half Duplex, 1000Mbps Full Duplex, Auto-negotiation, MDI/MDIX, Wire-Speed tranfer, | |
| Management | Console port, Telnet/SSH, SNMP V1/V2/V3, RMON, Web, TFTP and CLI | |

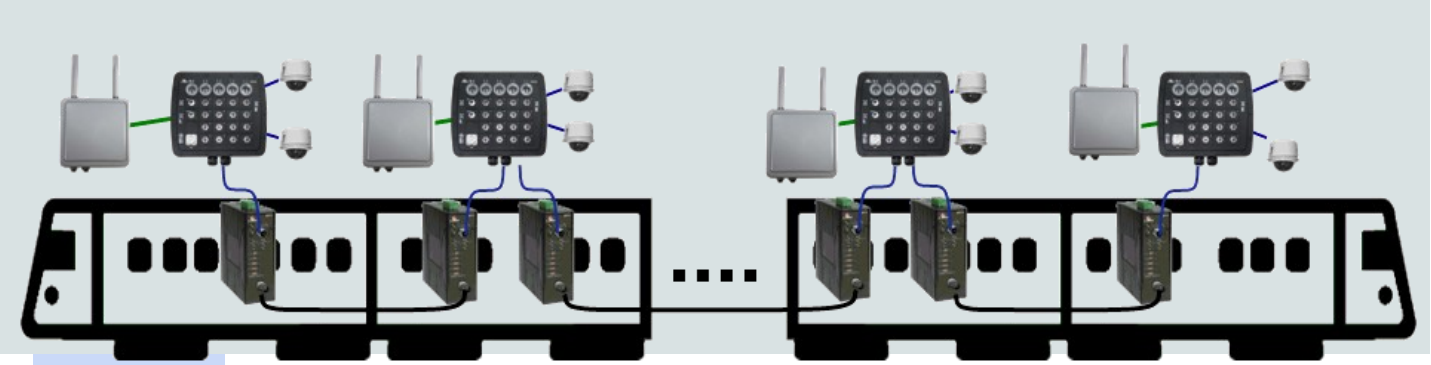



The **SWMP-HR-8TPM-2GM** switch have been developed to be used inside the rolling stock railway or subway. It concentrate Ethernet flow and provide POE to power the camera, the Wifi hot-spots and all Ethernet probes. It comply to the EN50155 and the EN50121-3-2 environmental requirements. FE/GE copper and GSX/GLX LC fiber ports are provided with M12 waterproof connectors and power supply are connected over M23, both with high level of security against vibrations.




The **SWMP-HR67-8TM8TPM-2GM** is an IP67 graded hardened switch used in railway or subway rolling stock and powered in AC or DC. His strong waterproof case with M12 and M23 connectors protects the Ethernet switch from humidity, the dust and maintains cables against vibrations in hostile environment of traction machines and wagons. The POE version powerfeeds up to 8 Ethernet devices like AP, VoIP phones, Ethernet PLC… This switch complies to the EN50155 and the EN50121-3-2 environmental requirements to be used in rolling stock material.

*Transmission and power supply of IP cameras and Wifi Access Points are provided by SWMP-HR67-8TM8TPM-2GM. The switches are interconnected over coax cable with Ethernet over VDSL COAX-HR-TM up to 85Mbps.*



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# Ethernet switch for Rolling coach & Bus, E-Mark approval

| MODELS | SWD-I-4TPS-4TX<br>SWD-I-4TPS-3TX-F | SWD-H-4TPS-4TX<br>SWD-H-4TPS-3TX-F |
|---|---|---|
| MANAGEMENT | AUTOMATIC | |
| *Environnemental* | | |
| Port capacity | 8 FE | 8 FE |
| Industrial -10 at 60°C<br>Factory test -20 at 70°C | √ | |
| Hardened -40 at 75°C<br>Factory test -40 at 85°C | | √ |
| Industrial compliance | IEC61000-6-2 Industrial generic, CE, FCC, UL608, NEMA TS1 & TS2 | |
| Inside Coach and Bus | Qualification E-MARK 10 | |
| *Ethernet ports* | | |
| 10/100BaseT POE PsE 802.3af | 4 or 3 | 4 or 3 |
| 10/100BaseT POE PsE 802.3af | 4 ports at 15,4W | 4 ports at 15,4W |
| Optical ports 100FX | 0 or 1 fixed SC or ST | 0 or 1 fixed SC or ST |
| Alarm relay | Yes set up per port or power supply | |
| *Physical / Electrical* | | |
| Casing | IP30 aluminium, Rail-DIN, Fanless | IP30 aluminium, Rail-DIN, Fanless |
| Dimensions W x D x H mm | 62 x 110 x 135 | 60 x 125 x 145 |
| Power supply, 2 redundant | 2 x 48Vcc, jack 48Vcc | 2 x 48Vcc, jack 48Vcc |
| Consumption w:o POE / w POE | 10 W / 72 W | 10 W / 72 W |
| *Performances* | | |
| MAC address table size | 1024 | 1024 |
| Packet buffer memory (Bits) | 1M | 1M |


**SWD-I-4TPS-4TX and SWD-H-4TPS-4TX .**

Theses POE switches and 12 to 48V converters have got the E-Mark approval and can be installed in Buses or Coaches and in order to support IP cameras and ticketing machines.

They provide POE power over Ethernet ports to power feed Ethernet equipments.

# SWEDD-xxxx-C Hybrid Layer 2 switches with SyncE and PTP IEEE1588v2

| MODELS | SWEDD-4TGX4GSF | SWEDD-4TGX4GSF-C | SWEDD-xxxx-H |
|---|---|---|---|
| MANAGEMENT | Layer 2 managed | | |
| *Environnemental* | | | |
| Standard -5 to 50°C | √ | √ | |
| Hardened -20 to 70°C | | | √ |
| Industrial | CE, FCC | | |
| Power substation automation | IEC61850-3, IEEE1613 | | |
| *WAN, LAN Ethernet ports and encapsulated ports* | | | |
| Maximum throughput | 8 GE | 8 GE | 8 GE |
| WAN ports | 2 SFP 1000SX/LX | 2 SFP 1000SX/LX | 2 SFP 1000SX/LX |
| 10/100/1000Baset LAN ports | 4 | 4 | 4 |
| 10/100/1000Baset POE PSE ports | Option 2 port POE | Option 2 port POE | Option 2 port POE |
| 1000SX/LX LAN port | 2 SFP 1000SX/LX | 2 SFP 1000SX/LX | 2 SFP 1000SX/LX |
| Asynchronous ports | Option 4 RS232/RS485 | Option 4 RS232/RS485 | Option 4 RS232/RS485 |
| Input/Output dry contacts | Option 2 In 2 Out | Option 2 In 2 Out | Option 2 In 2 Out |
| *Mechanical/Electrical* | | | |
| Format | IP30 metal case, DIN-rail, Fanless | | |
| Dimensions L x P x H | 67,2 x 167 x 219 | | |
| Power supply | Dual power DC 18-36Vdc or 36-72Vdc plus POE power -44 to -57Vdc | | |
| *Performance* | | | |
| MAC address table | 8192 | | |
| Switching capacity | 10 Gbps | | |
| *Network redundancy & ring* | | | |
| STP protocols | STP/RSTP/MSTP | | |
| Ring protection | LEAPS and IUT G.8032 | | |
| *Management and network's protocols* | | | |
| VLAN | VLAN per port and 802.1q tagging | | |
| QoS 802.1p | 802.1p with 4 queues of priority | | |
| Security of access | 802.1x per port w Radius client, 16 secure MAC addresses | | |
| Bandwidth Rate Control | 802.3x ingress/egress flow limitation per port | | |
| Ethernet | 10/100Mbps auto-rate, auto Full/Half Duplex, MDI/MDIX, Wire-Speed tranfert | | |
| RS232 encapsulation | Raw-TCP | | |
| Synchronization | SyncE WAN ports and PTP Slave IEEE 1588 v2 | | |
| Management | Over LAN and WAN in SSHv2,Web browser HTTP/HTTPS, SNMP v1/2/3, FTP | | |

**SWEDD-4TGX4GSX-C**

This Hybrid Gigabit Ethernet switch is carrying pure Ethernet flows, encapsulated RS232/RS485 and Dry Contacts over Gigabit network.

This Gigabit Ethernet switch is supplied in option with 2 GE SFP WAN, 6 GE LAN and 2 Combo LAN.

Thanks to the OAM support it is a real Ethernet Demarcation Device.

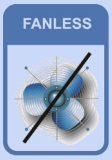
Support of SyncE network and PTP 1588 slave functions provides frequency and Phase synchronization on tributaries to synchronize IP radio-truncking BTS or PLC.

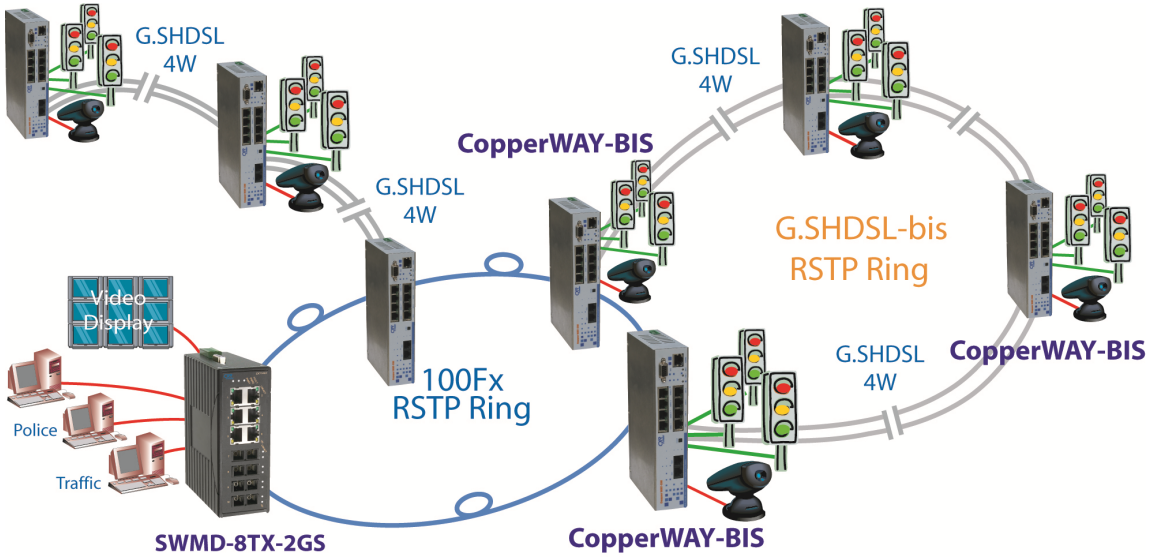
An hardened version is also available.

This device is used for

- Intelligent Traffic System,
- High level of automatism system,
- Telcos for IP BTS
- ...

# Hybrid Ethernet/FO/G.Shdsl w RS232/485 Layer 2 managed switches




| MODELS | CopperLAN-Bis-MCx | CopperWAY-Bis-2TTX | CopperWAY-Bis-2W -MC | CopperWAY-Bis-2W -4RS-MC | CopperWAY-Bis-4W -MC | CopperWAY-Bis-4W -4RS-MC | CopperWAY-Bis-SFP-HV |
|---|---|---|---|---|---|---|---|
| MANAGEMENT | Layer 2 managed | | | | | | |
| *Environnemental* | | | | | | | |
| Industrial -10 to 60°C | √ | - | - | - | - | - | - |
| Industrial -20 to 65°C | - | √ | √ | √ | √ | √ | √ |
| Industrial | CE, FCC | | | | | | |
| *WAN, LAN Ethernet ports and encapsulated ports* | | | | | | | |
| Maximum throughput | 4 FE + 1 FE/DSL | 2 FE + 2 FE/DSL | 6 FE + 2 FE/DSL | | 6 FE + 2 FE/DSL | | 1GE+ 2 FE + 2 FE/DSL |
| User ports | 4 | 2 | 4 | | 4 | | 4 |
| 10/100Baset POE PSE ports | include 1 POE PsE 802.af | - | include 1 POE PsE 802.af | | include 1 POE PsE 802.af | | |
| Fiber ports | - | - | 2 x 100FX SFP | | 2 x 100FX SFP | | 1 x 1000GSX/GLX SFP |
| Ethernet/EFM/G.SHDSL .Bis | 1 port w 2/4 wires | 2 ports w 2 wires | 2 ports w 2 wires | | 2 ports w 2/4 wires | | 2 ports w 2/4 wires |
| DSL line isolation | - | - | - | | - | | 10KV |
| Coding | TC-PAM | TC-PAM16/32/64/128 | TC-PAM16/32/64 | | TC-PAM16/32/64 | | TC-PAM16/32/64/128 |
| Maximum rate per direction | 11,4 Mbps | 15 Mbps | 11,4Mbps | | 22 Mbps | | 11,4 Mbps |
| Asynchronous ports | 1 RS232 | 1 RS232 | - | 1 RS232/RS485 + 3 RS232 | - | 1 RS232/RS485 + 3 RS232 | 1 RS232 |
| Input/Output dry contacts | - | - | - | 2 In 2 Out | | 2 In 2 Out | 2 In 2 Out |
| *Mechanical/Electrical* | | | | | | | |
| Format | IP30 metal case DIN-rail, Fanless | IP30 metal case DIN-rail, Fanless | IP30 metal case DIN-rail, Fanless | | IP30 metal case DIN-rail, controled fan | | IP30 metal case DIN-rail, controled fan |
| Dimensions L x P x H | 41 x 120 x 170 | 45 x 140 x 155 | 44x 144 x 154 | | 44x 144 x 154 | | 70x 150 x 280 |
| Power supply | MC2= 9-36Vcc MC1- 36-72V | 9-36Vcc | 2 x 9-55Vcc | | 2 x 9-55Vcc | | 9-36Vcc |
| *Performance* | | | | | | | |
| MAC address table | 1024 | 1024 | 8192 | | 8192 | | 8192 |
| Frame buffer/bits | 512K | 512K | 1M | | 1M | | 1M |
| *Network redundancy & ring* | | | | | | | |
| STP/RSTP | STP | STP/RSTP | | | | | |
| *Management and network's protocols* | | | | | | | |
| VLAN | VLAN per port and 802.1q tagging, Q-in-Q | VLAN per port and 802.1q tagging | | | | | |
| QoS 802.1p | w 2 priority queues | 802.1p with 4 queues of priority | | | | | |
| Security of access | | 802.1x per port w Radius client, 16 secure MAC addresses | | | | | |
| Bandwidth Rate Control | 802.3x ingress/egress flow limitation per port | | | | | | |
| Ethernet | 10/100Mbps auto-rate, auto Full/Half Duplex, MDI/MDIX, Wire-Speed tranfert | | | | | | |
| RS232 encapsulation | Raw-TCP/UDP | Raw-TCP, HNZ, Bloc Message, COM port according to RFC2217 compatible w Tactical's Serial IP | | | | | |
| Console port | RS232 | USB | RS232 | | | | USB |
| Management | | Over console port LAN and WAN in SSH, SNMP V2, Web browser HTTP/HTTPS, FTP | | | | | |

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# CopperWAY-Bis Hybrid Ethernet/FO/G.Shdsl Layer 2 switches with RS232/485 and contact

*The CXR CopperWay-Series is a range of Hybrid Ethernet switches. They are mainly used in Transportation for road infrastructure, traffic light, CCTV and for Utilities Smart Grid or production application. These switches are Hybrid because they are interconnected with fibers and with DSL over coppers, but also because they support not only Ethernet or Ethernet POE but also asynchronous links RS232/RS485 and Dry Contacts encapsulated over IP.*

*The new CopperWAY-Bis-HV range with its 10KV isolation is over suited for the Electricity distribution to run in 20KV electrical sub-stations and carry especially SCADA, information from and to electricity meters.*

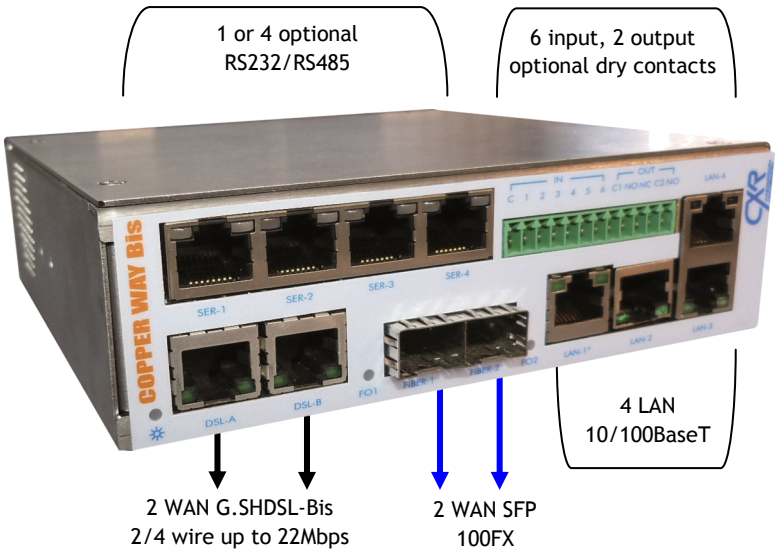
## CopperWAY-Bis

**Hybrid interconnection/transport**

over Ethernet copper 100Baset, Ethernet fiber 100FX and GSHDSL.bis EFM at 5.6Mbps to 22Mbps over 2 or 4 wires up to 10km.

**Hybrid tributaries**

4 Ethernet ports with one Ethernet POE PSE,
4 asynchronous RS232/RS485 ports
6 Dry Contact Inputs and 2 Outputs.
Supports Bus and Ring RSTP structure.
A complete Layer2 switch, with VLAN, QoS…





## CopperWAY-Bis-2TTX

**Bottom of the range product**

with 2 GSHDSL.bis EFM up to 15Mbps over 2 wires up to 10km.
Two Ethernet ports and one asynchronous RS232 port
Supports Bus and Ring RSTP structure.Layer2 switch, with VLAN, QoS…

## AMS16 and SpeederLAN card

**The chassis supporting DSL, fiberoptic, TDM (E1,E3, X21, V35..)**
**SpeederLAN cards support Ethernet over 1, 2, 4 and 8 pairs bounding**
This solution can concentrate up to 16 SpeederLAN-Bis-2x2 cards up to 64 distant CopperWAY-Bis….

# The HV range, isolated DSL at 10KV

## CopperWAY-Bis-SFP-HV

**Ethernet switch GSHDSL.bis modem for 20KV electric substation**

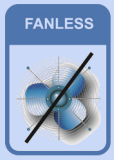
with 2 GSHDSL.bis EFM up to 11Mbps with 2 wires isolated at 10kV.
1 Gigabit Ethernet SFP and 4 Ethernet ports and 1 RS232 ports
Supports Bus and Ring RSTP topology. Layer2 switch, with VLAN, QoS…

## MV16HV

**This chassis provides the isolation for 16 pairs at 10kV**

this chassis Is used in DSL concentration sites for power companies to isolate the GSHDSL or GSHDSL.bis lines before the connection to the SpeederLAN cards fitted in AMS16 chassis.

# Industrial and carrier Ethernet
# Layer 2 managed switches - FTTb




| MODELS | SWM-8TX-UCB | SWM-24TX-2UCB | SWM-24TGX-4GSF |
|---|---|---|---|
| MANAGEMENT | Layer 2 managed | | |
| *Environment* | | | |
| Industrial -10 to 60°C | √ | √ | √ |
| Industrial | IEC61000-6-2 EMC Generic Standard immunity for Industrial env., CE | | |
| *Ethernet ports* | | | |
| Maximum throughput | 8 FE + 1 GE | 24 FE + 2 GE | 24 FE + 2 GE |
| User ports | 8<br>10/100BaseT | 24<br>10/100BaseT | 24<br>10/100/1000BaseT |
| Uplink FE/GE/FX/GX | 1 Universal Combo<br>10/100/1000BaseT +<br>SFP 100FX/1000SX/LX | 2 Universal Combo<br>10/100/1000BaseT +<br>SFP 100FX/1000SX/LX | 4 SFP 1000SX/LX/ZX<br>by SFP |
| *Mechanical/Electrical* | | | |
| Format | 19" 1U w brackets | 19" 1U w brackets | 19" 1U w brackets |
| Dimensions L x P x H | 205 x 130 x 40 mm | 440 x 192 x 44 mm | 440 x 290 x 44 mm |
| Power supply | AC or DC 36-72v | AC or DC 36-72v | AC or DC 36-72v |
| *Performance* | | | |
| Mac address table size | 8K | 8K | 16K |
| Packet Buffer Memory/bits | 3,6 Gbps | 8,8 Gbps | 56 Gbps |
| *Network redundancy & ring* | | | |
| STP/RSTP | Yes | | |
| MSTP | Yes | | |
| Protection Ring < 50ms | Yes | | Yes G8032 |
| Port Mirroring | 1:1 and 1:n | | |
| *Management and network's protocols* | | | |
| VLAN | VLAN per port and tagged 802.1q , S-VLAN/C-VLAN Q-in-Q and GVRP | | |
| QoS 802.1p | Per port, tag 802.1p, IPV4 ToS/DiffServ, IPV6 Traffic Class, 4 priority queues | | idem with 8 queues |
| IGMP | Multicast w IGMP Snooping V1,V2 and V3, IGMP Proxy, IGMP fast leave, Inter-VLAN multicast dupplication | | |
| Security of access | 802.1x per port w Radius client, ACL ... please see datasheet | | |
| Bandwidth Rate Control | 802.3x for ingress/egress flow per port | | |
| Other protocols | DHCP server/relay and option 82, LACP truncking, NTP client and relay... | | |
| IP routing | | | Static routing |
| Ethernet | 10/100Mbps Full/Half Duplex, 1000Mbps Full Duplex, Auto-negociation, MDI/MDIX | | |
| Management | Over console port or LAN or WAN with Telnet/SSH, SNMP V1/V2/V3, RMON, Web browser, TFTP et CLI | | |

# Layer 2 and 3 managed Switches/Routers
# Carrier Ethernet - GE/10GE *MEF 9 &14*

| MODELS | SW3L-24TX-2GSF-2UCB or SW3L-24FSF-2GSF-2UCB | SW3L-48TX-2GSF-2UCB or SW3L-48FSF-2GSF-2UCB | SW3G-20TGX-4UCB or SW3G-20USF-4UCB | SW3G-24TGX-4UCB or SW3G-44TGX-4UCB |
|---|---|---|---|---|
| nagement and network's proto | Layer 3 manageable | | Layer 3 manageable | |
| ***Environmental*** | | | | |
| Working temperature -10 à 55°C | √ | √ | √ | √ |
| Industrial | IEC61000-6-2 , CE | | | |
| ***Ethernet ports*** | | | | |
| Maximum throughput | 24 FE + 4 GE | 48FE + 4 GE | 24 GE + 4 10GE | 48 GE + 4 10GE |
| User ports | 24 x 10/100BaseT or 24 x 100FX SFP | 48 x 10/100BaseT or 48 x 100FX SFP | 20 x 10/100/1000BaseT or 20 SFP 100FX/1000SX/LX/ZX | 44 x 10/100/1000BaseT or 44 SFP 100FX/1000SX/LX/ZX |
| Uplink FE/GE/FX/GX | 2 Universal Combos 10/100/1000BaseT + SFP 100FX/1000SX/LX and 2 SFP 1000SX/LX | 4 SFP 100FX/1000SX/LX | 4 Universal Combos 10/100/1000BaseT and SFP 100FX/1000SX/LX | |
| Uplink 10 GE | - | - | Maximum 4 x 10GE: 2 optional modules of 2 10G | |
| ***Mechanical/Electrical*** | | | | |
| Format | 19" 1U | 19" 1U | 19" 1U | 19" 1U |
| Dimensions L x P x H | | | | |
| Power supply | AC or DC 36-72v | AC or DC 36-72v | 2 modules AC or DC 36-72v | |
| ***Performance*** | | | | |
| Mac address table size | 8172 | 8172 | 32688 | 32688 |
| Switching/ backplane | 12,8Gbps/32Gbps | 17,6Gbps/32Gbps | 96Gbps / 128Gbps | 128Gbps / 176Gbps |
| ***Network redundancy & ring*** | | | | |
| STP/RSTP/MSTP | Yes | | Yes | |
| Ring Protection < 50ms | Yes: ESR ring, R-link | | Yes: ESR ring, R-link | |
| G.8031/G.8032 | - | | Yes | |
| VRRP | Yes | | Yes | |
| ***Management and network's protocols*** | | | | |
| Routing | Static routing and VLAN routing, RIP 1&2, OSPF v2, BGP v4 | | Static routing and VLAN routing, RIP 1&2, OSPF v2, BGP v4 | |
| VLAN | VLAN per port and tagging 802.1q , S-VLAN/C-VLAN Q-in-Q and GVRP | | | |
| QoS 802.1p | Port and tag 802.1p, IPV4 ToS/DiffServ, IPV6 Traffic Class, 8 priority queues | | | |
| IGMP | Multicast avec IGMP Snooping V1,V2 and V3, Inter-VLAN multicast dupplication | | | |
| Security of access | 802.1x per port with Radius Client, ACL ... see datasheet | | | |
| Bandwidth Rate Control | 802.3x administration for ingress/egress flow per port | | | |
| Other protocols | DHCP server/relay and option 82, LACP truncking, NTP client and relay... | | | |
| Ethernet | 10/100Mbps Full/Half Duplex, 1000Mbps Full Duplex, Auto-negociation, MDI/MDIX | | | |
| Management | Over console port or LAN or WAN with Telnet/SSH, SNMP V1/V2/V3, RMON, Web browser, TFTP et CLI | | | |
| MEF and cross-administration | MEF 9, MEF 14, OAM Ethernet , 802.3ah, Y.1731, IEEE802.1ag | | | |

# Layer 2 to 4 Terabit Routing Switches
# High density GE/10GE - MPLS



| MODELS | SW3R-03 | SW3R-06 | SW3R-12 |
|---|---|---|---|
| *Modular system* | | | |
| Main control card slots | 2 | 2 | 2 |
| Services card slots | 3 | 8 | 12 |
| Power supply slots | 3 | 6 | 6 |
| Fan slots | 1 | 3 | 4 |
| *Capacity* | | | |
| Backplane capacity | 2 Tbps | 6 Tbps | 6Tbps |
| Switching capacity | 1,92 Tbps | 1,25/2,56 Tbps | 1,92/3,84 Tbps |
| Maximum throughput | 1 440 Mbps | 960 /1 920 Mbps | 1 440 / 2 880 Mbps |
| Maxi nb of 10GE ports | 96 x 10GE | 128 x 10GE | 192 x 10GE |
| Maxi nb of GE ports | 144 GE | 384 GE | 576 GE |
| Service 10 GE card | Card with 4 optical 10GE ports with SFP+ | | |
| Service GSX/GLX/GZX card | Card with 48 optical GE ports with SFP | | |
| Service Copper card | Card with 48 10/100/1000BaseT ports RJ45 | | |
| *Mechanical/Electrical* | | | |
| Format | 19" 5U | 19" 13U | 19" 16U |
| Dimensions L x P x H | 440 x 478,3 x 220 | 440 x 460 x 574 | 440 x 460 x 710 |
| Power supply | AC or DC -48 to -60v | AC or DC -48 to -60v | AC or DC -48 to -60v |
| *Network redundancy & ring* | | | |
| STP | STP/RSTP/MSTP | | |
| | BPDU, protection, root protection, loop protection, BDPU tunnel | | |
| Ring protection | G.8032 with 50ms recovery | | |
| VRRP | VRRP and BFD for VRRP | | |
| *Management and network's protocols* | | | |
| IP Routing | IPv4 and IPv6 Static routing.<br>IPv4 routing: RIP 1&2, OSPF v2, BGB v4 and IS-IS. IPv6 routing: RIPng, OSPF v3, BGP v4+, ISIS v6 | | |
| MPLS | Static LSP, static VLAN to MPLS mapping. L2VPN, L3VPN. MPLS OAM | | |
| VLAN | Access, Trunk and Hybrid VLAN. VLAN per port and tagging 802.1q , S-VLAN/C-VLAN Q-in-Q | | |
| QoS 802.1p | Port and tag 802.1p, IPV4 ToS/DiffServ, IPV6 Traffic Class on layer2/3/4, 8 priority queues | | |
| Multicast | IGMP and IGMP Snooping V1,V2 and V3, Inter-VLAN multicast dupplication.<br>PIM-DM, PIM-SM, PIM-SSM. Multicast ACL, Multicast VPN | | |
| Security of access | 802.1x per port with Radius/TACACS client, ACL ... see datasheet | | |
| Bandwidth Rate Control | 802.3x administration for ingress/egress flow per port | | |
| Other protocols | DHCP server/relay and option 82, LACP truncking, NTP client and relay... | | |
| Ethernet | 10/100Mbps Full/Half Duplex, 1000Mbps Full Duplex, Auto-negociation, MDI/MDIX | | |
| Administration | Over consol port/LAN/WAN with Telnet/SSH, SNMP V1/V2/V3, RMON,TFTP et CLI | | |
| OAM | OAM Ethernet , 802.3ah, Y.1731, IEEE802.1ag | | |

# SFP /SFP+ / XSF
# 100FX, 1000GX, 10GE, WDM, CWDM & DWDM

| | |
|---|---|
| **100FX, STM1-OC3 SFP MODULE, support E1/E3 of CXR FO and MX devices, Standard range -5 to +70°C** | |
| **SFP-STM1-MM-850** | SFP module 100FX, STM1 - OC3 multimode 850nm, compatible with FO-xxxxx-MM, LC |
| **SFP-STM1-MM2** | SFP module 100FX, STM1 - OC3 multimode 1310 for 2km, LC |
| **SFP-STM1-SM30** | SFP module 100FX, STM1 - OC3 single mode 1310 for 30km, LC, with DDM |
| **SFP-STM1-SM60** | SFP module 100FX, STM1 - OC3 single mode 1310 for 50km, LC |
| **SFP-STM1-SM100-15** | SFP module 100FX, STM1 - OC3 single mode 1550 for 100km, LC, with DDM |
| **SFP-STM1-SM120-15** | SFP module 100FX, STM1 - OC3 single mode 1550 for 120km, LC, with DDM |
| **SFP-STM1-SM160-15D** | SFP module 100FX, STM1 - OC3 single mode 1550 for 160km, LC, with DDM, L-4.2 |
| **SFP-STM1-SM200-15D** | SFP module 100FX, STM1 - OC3 single mode 1550nm w 46 to 50dB budget for 200km, LC, with DDM, L-4.2 |
| **SFP-STM1-SM15-W13** | SFP module 100FX, STM1 - OC3 single mode CWDM 1310 for 15km, LC Bidi, with DDM |
| **SFP-STM1-SM15-W15** | SFP module 100FX, STM1 - OC3 single mode CWDM 1550 for 15km, LC Bidi, with DDM |
| **SFP-STM1-SM60-W13** | SFP module 100FX, STM1 - OC3 single mode CWDM 1310 for 60km, LC Bidi, with DDM |
| **SFP-STM1-SM60-W15** | SFP module 100FX, STM1 - OC3 single mode CWDM 1550 for 60km, LC Bidi, with DDM |
| **100FX, STM1-OC3 SFP MODULE, support E1/E3 of CXR FO and MX devices, Extended Temperature -40°C to +85°C** | |
| **SFP-STM1-MM-H** | SFP module 100FX w DD, multimode 1310nm portée 2 km, connector LC, -40°C-85°C |
| **SFP-STM1-SM30-H** | SFP module 100FX w DD, single-mode 1310nm, budget for 30km , connector LC, -40°C-85°C |
| **SFP-STM1-SM15-W13H** | SFP module 100FX, STM1 - OC3 single mode CWDM 1310 for 15km, LC Bidi, with DDM |
| **SFP-STM1-SM15-W15H** | SFP module 100FX, STM1 - OC3 single mode CWDM 1550 for 15km, LC Bidi, with DDM |
| **1000SX/LX/ZX and 100FX SFP MODULE, Standard range -5 to +70°C** | |
| **SFP-GSX-MM** | SFP module 1000SX/100FX w DD, multimode 850nm, budget 8,0dB for 550m, connector LC |
| **SFP-GSX-MM-1310** | SFP module 1000SX/100FX w DD, multimode 1310nm, budget 16,0dB for 2km, connector LC |
| **SFP-GLX-SM20** | SFP module 1000LX/100FX w DD, single-mode 1310nm, budget 17,0dB for 20km , connector LC |
| **SFP-GZX-SM50** | SFP module 1000ZX/100FX w DD, single-mode 1550nm, budget 19,0dB for 50km , connector LC |
| **SFP-GZX-SM80** | SFP module 1000ZX/100FX w DD single-mode 1550nm, budget 24,0dB for 80km , connector LC |
| **SFP-GZX-SM120** | SFP module 1000ZX/100FX w DD single-mode 1550nm, budget 24,0dB for 80km , connector LC |
| **SFP-GLX-SM20W13** | SFP module 1000LX/100FX w DD, single-mode 1310nm WDM single fiber, budget 12,0dB for 20km , LC Bidi. |
| **SFP-GLX-SM20W15** | SFP module 1000LX/100FX w DD, single-mode 1550nm WDM single fiber, budget 12,0dB for 20km , LC Bidi. |
| **SFP-GZX-SM60W13** | SFP module 1000LX/100FX w DD, single-mode 1310nm WDM single fiber, budget 24,0dB for 60km , LC Bidi. |
| **SFP-GZX-SM60W15** | SFP module 1000LX/100FX w DD, single-mode 1550nm WDM single fiber, budget 24,0dB for 60km , LC Bidi. |
| **SFP-GZX-SM80W1490** | SFP module 1000LX/100FX w DD, single-mode 1490nm WDM single fiber, budget 24,0dB for 80km , LC Bidi. |
| **SFP-GZX-SM80W1570** | SFP module 1000LX/100FX w DD, single-mode 1570nm WDM single fiber, budget 24,0dB for 80km , LC Bidi. |
| **1000SX/LX/ZX and 100FX SFP CWDM / DWDM MODULE, Standard range -5 to +70°C** | |
| **SFP-GLX-SM80-Cxx** | SFP module 1000LX/100FX w DD, CWDM lambda au choix de 1430 to 1610nm, budget 24,0dB for 80km, LC |
| **SFP-GLX-SM120-Cxx** | SFP module 1000LX/100FX w DD, CWDM lambda, choice from 1430 to 1610nm, budget 32dB for 120km, LC |
| **SFP-GLX-SM150-Cxx** | SFP module 1000LX/100FX w DD, CWDM lambda, choice from 1430 to 1610nm, budget 37dB for 150km, LC |
| **SFP-GLX-SM80-Dxx** | SFP module 1000LX/100FX w DD, DWDM lambda au choix de 1430 to 1610nm, budget 24,0dB for 80km, LC |
| **SFP-GLX-SM120-Dxx** | SFP module 1000LX/100FX w DD, DWDM lambda, choice from 1430 to 1610nm, budget 32dB for 120km, LC |
| **1000SX/LX/ZX and 100FX SFP MODULE, Extended Temperature -40°C to +85°C** | |
| **SFP-GSX-MM-H** | SFP module 1000SX/100FX w DD, multimode 850nm, budget 8,0dB for 550m, LC, working temp. -40°C to +85°C |
| **SFP-GSX-MM-1310H** | SFP module 1000SX/100FX w DD, multimode 1310nm, budget 16,0dB for 2km, LC, working temp.-40°C to +85°C |
| **SFP-GLX-SM10-H** | SFP module 1000LX/100FX w DD, single-mode 1310nm, budget 13,0dB for 10km , LC, working temp. -40°C to +85°C |
| **SFP-GLX-SM20-H** | SFP module 1000LX/100FX w DD, single-mode 1310nm, budget 17,0dB for 20km , LC, working temp-40°C to +85°C |
| **COPPER SFP MODULE, Standard range -5 to +70°C** | |
| **SFP-TTX** | SFP module for 100FX slot to copper Ethernet 100BaseT RJ45 |
| **SFP-TGTX** | SFP module for 1000FX slot to copper Ethernet 10/100/1000BaseT RJ45 |
| **XFP 10GE module standard range -10 à +70°C** | |
| **XFP-10G-SR-MM** | XFP 10GE-LS module multi-mode 850nm, budget for 300m, LC/PC connector. |
| **XFP-10G-LR-SM10** | XFP 10GE-LR module singlemode 1310nm, budget for 10km, LC/PC connector. |
| **XFP-10G-ER-SM40** | XFP 10GE-ER module singlemode 1310nm, budget for 40km, LC/PC connector. |
| **XFP-10G-ZR-SM80** | XFP 10GE-ZR module singlemode 1550nm, budget for 80km, LC/PC connector. |
| **XFP-10G-ZR-SM80-Cxx** | XFP 10GE-ZR module singlemode CWDM lambda Cxx, budget for 80km, LC/PC connector. |
| **SFP Plus 10GE module standard range -10 à +70°C** | |
| **SFP-10G-SR-MM** | SFP+ 10GE-LS module multi-mode 850nm, budget for 300m, LC/PC connector. |
| **SFP-10G-LR-SM10** | SFP+ 10GE-LR module singlemode 1310nm, budget for 10km, LC/PC connector. |
| **SFP-10G-ER-SM40** | SFP+ 10GE-ER module singlemode 1550nm, budget for 40km, LC/PC connector. |
| **SFP-10G-ZR-SM80** | SFP+ 10GE-ZR module singlemode 1550nm, budget for 80km, LC/PC connector. |
| **SFP-10G-ER-SM40-Cxxx** | SFP+ 10GE-ER module singlemode CWDM color Cxx , budget 14 to 18dB for 40km, LC/PC connector. |
| **SFP-10G-ZR-SM80-Cxxx** | SFP+ 10GE-ER module singlemode CWDM color Cxx , budget for 80km, LC/PC connector. |
| **OTHER SFP MODULES** | |
| **SFP-STM1/4-xx** | SFP module 100FX, STM1/STM4 -OC3/OC12 LC, with DDM |
| **SFP-STM16-xx-D** | SFP module STM1/STM4/STM16 or OC3/OC12/OC48 , with DDM |

**WDM SFPs** are use in pairs:

- first side should be a version W3 transmitting at 1310nm
- second side should be a version W5 transmitting at 1550nm

They use a single core fiber and then the LC connector is simplex or named LC Bidi.

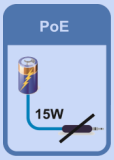
The **CWDM SFP** are available in 18 colors, to be specified on ordering

The **DWDM SFP** are available in the C-Band colors to ITU channel, to be specify on ordering

# Distribution of Ethernet POE

*CXR offers a port folio of solutions to distribute together Ethernet/IP data and power over the Ethernet line as POE Ethernet. Mainly used to deploy IP-camera, IP-phone, Wifi hot-spot, this technology can power many new products. These are used in transportation (bus, train, road, airport), by energy suppliers/transporter, and in many industries as the security survey In-door or Out-door.*

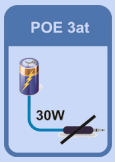
## ETHERNET POE




**POE PsE port** — This **P**ower **S**ourcing **E**thernet port feature supplies 48V power over the line to power feed another equipment at the end of the line.

**POE PD port** — Device connected to POE port powered from the line, it is a **P**owered **D**evice.

**IEEE802.3af** — Regulation describes the power feeding over Ethernet lines: The PsE port should supply 48v (44 to 57V) with 15,4W and 350mA. The PD port should receive 37 to 57V w a maximum of 12,95W. Lower level are accepted particularly for Cat3 cables. Four class 0, 1 ,2, 3 describe this levels.




**IEEE802.3at** — This class 4 regulation involves higher power. PsE should supply 30/34,2W and PD will receive 25,5W.

**POL** — **P**ower **O**ver **L**ine: In one pairs of DSL modems, the local modem is power-feeding the remote modem over the line. The remote modem could be POE PSE of his local Ethernet ports. The distance is limited by the temperature dispersion as the copper diameter is smaller.

# Power supplies for switches and converters with Industrial & Hardened casing

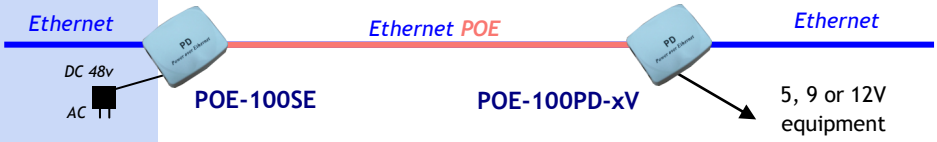
CXR offers AC/DC and DC/DC converters to power our range of switches and Ethernet converters. For selection please consider:

- Voltage and power requirements.
- Connection: terminal block, self blocking jack or standard jack.
- Din-rail/desktop/single block and working temperature

| | |
|---|---|
| **ACDC-48V-35W** | AC to DC 48V 35W adapter for MD, FO, CV, TS, CIP delivered in 48V (include 1200000112+7055140107) |
| | |
| **PS-DIN-12V-40W** | AC/DC DIN rail pow er 40W, Input 85 to 264Vac, output on terminal block 12V 0 to 3,33A , L x H x D =40x90x100 |
| **PS-DIN-12V-75W** | AC/DC DIN rail pow er 75W, input 85 to 264Vac, output on terminal block 12V 0 to 6,3A , L x H x D =55x125,2x100 |
| **PS-DIN-12V-120W** | AC/DC DIN rail pow er 120W, input 85 to 264Vac, output on terminal block 12V 0 to 10A , L x H x D =65x125,2x100 |
| **PS-DIN-24V-30W** | AC/DC DIN rail pow er 30W, input 85 to 264Vac, output on terminal block 24V 0 to 1,5A , L x H x D =78x93x56 |
| **PS-DIN-24V-240W** | AC/DC DIN rail pow er 240W, input 88 to 264Vac, output on terminal block 24V 0 to 10A , L x H x D =63x125,2x113,5 |
| | |
| **ACDC-I-5V-9W-J25** | AC to 5V DC 9W at -20 to 60°C, standard jack 2.5mm for FOC/FOCM and FOCD-I, AC cord IEC320/C3, plastic case |
| **ACDC-I-48V-36W-J21** | AC to 48V DC 36W at 0 to 40°C, 28W up to 50°C, 5.5/2.5mm standard jack for FOCD-I-TPS, DC cord 1.2m, AC cord IEC320/C8 1.5m w ith European plug, plastic case |
| **ACDC-I-48V-36W-J21UK** | AC to 48V DC 36W at 0 to 40°C, 28W up to 50°C, 5.5/2.5mm standard jack for FOCD-I-TPS, DC cord 1.2m, AC cord IEC320/C8 1.5m w ith UK plug, plastic case |
| **ACDC-H-12V-36W-P-JB** | AC to 12V 3A for Rail-DIN sw itch SWD-H and SWM-H , w orking temperature -40 to +75°C w jack , plastic case |
| **ACDC-H-12V-36W-M-JB** | AC to 12V 3A for for Rail-DIN sw itch SWD-H and SWM-H , w orking temperature -40 to +75°C w jack , metal case w fixation |
| **ACDC-I-24V-30W-DP** | AC to 24v 1,5A Adaptator for sw itch, w orking temperature -20 to +60°C block terminal, plastic box w ith DIN rail fixing |
| **ACDC-48V-75W-DM** | AC to 24v 1,5A Adaptator for sw itch, w orking temperature -20 to +60°C block terminal, plastic box w ith DIN rail fixing |
| **ACDC-48V-120W-JB** | AC to 24v 2,5A 120W Adaptator for sw itch, w orking temperature 0 to +50°C, blocking jack for Rail-DIN sw itch or FOC-H, plastic box |
| **ACDC-I-48V-120W-DM** | AC to DC48V 2,5A 120W adaptater for sw itch and media converter, tpure -10 to +60°C, terminal block, DIN-Rail metal box |
| **ACDC-H-48V-240W-DM** | AC to DC48V 5A 240W adaptater for sw itch and media converter, tpure -25 to 65°C and 75% at 70°C, terminal block, DIN-Rail metal box |
| **ACDC-H-48V-480W-DM** | AC to DC48V 10A 480W adaptater for sw itch and media converter, tpure -25 to 65°C and 75% at 70°C, terminal block, DIN-Rail metal box |
| **DCDC-I-12-48V-84W-DM** | DC-DC converter 12V to 48V 1,78A 85W Adapter, tpure -10 à +60°C, terminal block, DIN rail metal box |
| **DCDC-24-48-200W-DM** | DC-DC converter 24V to 48V 200W, galvanic isolation w fan. |

# Distribution of Ethernet POE

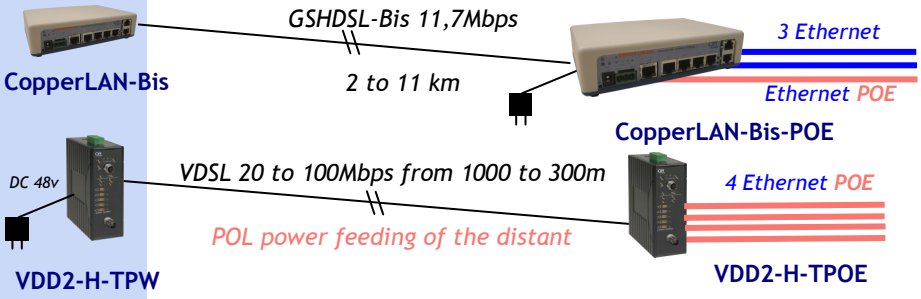
## Ethernet POE injector and splitter




*One box injects POE power over Ethernet line and another box extracts power to supply local equipments.*

**POE-100SE**
Power Sourcing box powered by AC adapter injects POE 48V &15,4W.
**POE-100PD-xV**
Splitter 5, 9 or 12Vcc from POE Ethernet to supply local Non POE device.

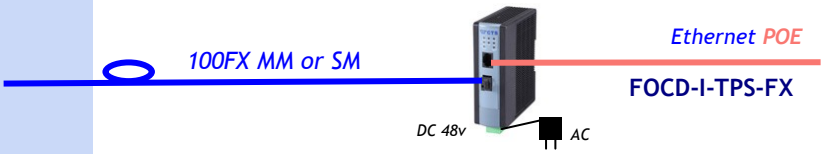
## Ethernet POE extension over xDSL




*Bridge/xDSL modem is extending LAN and provides POE Ethernet for IP-camera, IP-phone, hot-spot....*

**CopperLAN-Bis-POE**
Bridge/G.SHDSL-Bis 2/4 wire modem at 0,2 to 15Mbps up to 11km
4 x 10/100BaseT w 1 POE, VLAN, QoS...
**VDD-H-TPW**
Ethernet bridge/VDSL2 modem 2 wires, up to 100Mbps, and up to 1.7km. POL the distant over the DSL line.
**VDD-H-TPOE**
Ethernet bridge/VDSL2 modem, remote feed by the line, support 4 POE ports.

## FE or GE POE extention over fiber FX or GSX/GLX




*Media converter from fiber Ethernet to copper FE or GE POE Ethernet*

**FOCD-I-TPS-SFP or FOCD-I-GPS-SFP**
FX converts to 10/100BaseT or GSX/GLX to 10/100/1000BaseT with POE PsE 30W to feed local equipment.

## Unmanageable POE Switches, industrial DIN rail

*Industrial -10 to +60°C*

4 FE POE
SWD-I-4TPS-4TX
4 GE POE
SWDL-I-4GPS-GSF

*Hardened -40 to +75°C*

SWD-H-4TPS-4TX

*DIN-Rail industrial/hardened switches with dual 48Vcc power supply. Supports 4kV electric shock...*

**SWD-I-4TPS4TX / -4TPS3TX-FX..**
4 FE with 4 POE 15,4W, 4 FE non POE, 0 or 1 100FX MM or SM, -10°C to + 60°C
**SWD-H-4TPS4TX / -4TPS3TX-FX..** 4 FE with 4 POE 15,4W, 4 FE non POE, 0 or 1 100FX MM or SM, -40°C to + 75°C
**SWDL-I-4GPS-GSF**
4x10/100/1000BaseT POE ports 30W, 1 GSX/GLX SFP, -10°C to + 60°C

## Layer 2 manageable POE Industrial Switches

*Complies to IEC61000-6-2 for*

- *ITS Transport*
- *Intelligent-building*
- *Security control*
- *Factories*

SWMD-H-8TPS-2GE

SWM-H-16TPS-2GE

SWM-H-24TPS-2GPS-2GSX

*Supports 802.1x, VLAN 802.1q, QoS 802.1p, RSTP, MSTP, Alpha-Ring <15ms, Truncking, IGMP...from -40°C + 75°C*

**SWMD-H-8TPS w 0,1 or 2 GE/GX**
DIN case, 8 x10/100BaseT POE 15,4W, 0 to 2 x 1000BaseT/SX/LX
**SWM-H-16TPS w 0,1 or 2 GE/GX**
19'' case ,16 x10/100BaseT POE 15,4W, 1 or 2 x 1000BaseT/SX/LX

*Supports 802.1x, VLAN 802.1q, Q-in-Q, QoS 802.1p, RSTP, MSTP, ESR-Ring <50ms, Truncking, IGMP...*

**SWM-8TPS-2UCB-AC ou DC**
8 FE POE at 15,4W or 4 at 30W, 2 universal combo ports
**SWM-24TX-2UCB-AC ou DC**
24 FE POE 15,4W or 12 at 30W, 2 universal combo ports
**SWM-24GPS-4GSF-AC ou DC**
24 GE POE 30W, 4 GSX/GLX SFP

## Layer 2 & 3 POE Switches for Telco and Industries

SWM-8TPS-2UCB

SWM-24TPS-2UCB

SW3G-20TGPS-4UCB

*Industrial -10 to +60°C*

# DIN-rail Industrial and Hardened Unmanaged Ethernet POE switches


SWD-I-4TPS-4TX or

SWD-H-4TPS-4TX .

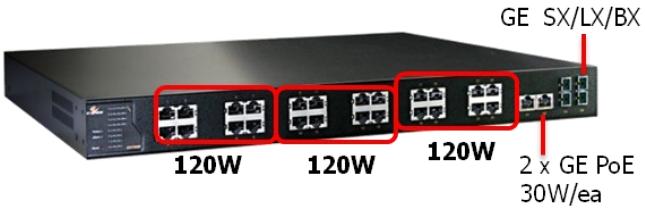
FOCI-I-GPS-GSF

SWDL-I-4GPS-GSF

| MODELS | SWD-I-4TPS-4TX<br>SWD-I-4TPS-3TX-F | SWD-H-4TPS-4TX<br>SWD-H-4TPS-3TX-F | FOCD-I-GPS-GSF | SWDL-I-4GPS-GSF |
|---|---|---|---|---|
| MANAGEMENT | AUTOMATIC | | | |
| *Environnemental* | | | | |
| Port capacity | 8 FE | 8 FE | 2 GE | 5 GE |
| Industrial -20 at 60°C<br>Factory test -20 at 70°C | √ | | √ | √ |
| Hardened -40 at 75°C<br>Factory test -40 at 85°C | | √ | | |
| Industrial compliance | IEC61000-6-2 Industrial generic, CE, FCC, UL608, NEMA TS1 & TS2 | | | |
| E-MARK for coach/bus | YES | YES | | |
| *Ethernet ports* | | | | |
| Copper UTP | 4 or 3 x 10/100BaseT | 4 or 3 x 10/100BaseT | 1 x 10/100/1000BaseT | 4 x 10/100/1000BaseT |
| POE PsE 802.3af (15,4W) | 4 | 4 | | |
| POE PsE 802.3at (30W) | | | 1 | 4 |
| Optical ports | 0 or 1 fixed 100FX | 0 or 1 fixed 100FX | 1 1000GSX/GLX SFP | 1 1000GSX/GLX SFP |
| Alarm relay | Yes set up per port or power supply | | | |
| *Physical / Electrical* | | | | |
| Casing | IP30 aluminium<br>Rail-DIN<br>Fanless | IP30 aluminium<br>Rail-DIN<br>Fanless | IP30 plastic<br>Rail-DIN, Wall mounting<br>Fanless | IP30 plastic<br>Rail-DIN, Wall mounting<br>Fanless |
| Dimensions W x D x H mm | 62 x 110 x 135 | 60 x 125 x 145 | 35 x 93 x 105 | 61 x 93 x 105 |
| Power supply<br>2 are redundant | 2 x 48Vcc<br>jack 48Vcc | 2 x 48Vcc<br>jack 48Vcc | 2 x 48Vcc<br>jack 48Vcc | 2 x 48Vcc<br>jack 48Vcc |
| Consumpsion<br>w:o POE / w POE | / 72 W | / 72 W | 4,2 W / 130 W | 4,2 W / 130 W |
| *Performances* | | | | |
| MAC address table sizes | 1024 | 1024 | 1024 | 2048 |
| Packet buffer memory (Bits) | 1M | 1M | 48K | 128K |

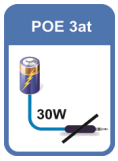
# Industrial and Hardened Layer 2 managed Ethernet POE switches


SWM-H-24TPS-2GPS-2GX-I-4GPS-GSF




| MODELS | SWMD-H-8TPS-G..<br>SWMD-H-8TPS-2G.. | SWM-H-8TPS-1G..<br>SWM-H-8TPS-2G..<br>SWM-H-16TPS-2G.. | SWM-H-24TPS<br>-2GPS-2GX/GSX |
|---|---|---|---|
| MANAGEMENT | LAYER 2 MANAGED | | |
| ***Environnemental*** | | | |
| Port capacity | 8 FE + 2 FE + 2 GE | 16 FE + 2 GE | 24FE + 4 GE |
| Hardened -40 at 75°C<br>Factory test -40 at 85°C | √ | √ | √ |
| Industrial compliance | | | |
| ***Ethernet ports*** | | | |
| Copper 10/100BaseT | | | |
| 10/100BaseT POE PsE 802.3af | 8 at 15,4W or | 8 or 16 at 15,4W | 24 FE +2 GE |
| 10/100BaseT POE PsE 802.3at | 4 at 15,4W and 4 at 30W | | 12 FE + 2GE |
| Optical ports 100FX | 2 SFP | - | - |
| Uplink 10/100/1000BaseT | 0 or 2 | 0 or 2 | 0 or 2 |
| Uplink 1000FX | 0 or 2 | 0 or 2 | 0 or 2 |
| Optic | fixed or SFP | fixed or SFP | Fixed |
| ***Physical / Electrical*** | | | |
| Casing | IP30 metal, Rail-DIN<br>Fanless | IP30 metal, 19" 1U<br>Fanless | IP30 metal, 19" 1U<br>Fan |
| Dimensions W x D x H mm | 65 x 145 x 165 | 442 x 205 x 44 | 442 x 343 x 44 mm |
| Power supply<br>2 are redundant | 2 x 48Vcc<br>jack 48Vcc | 47 at 55 Vdc | 1 ou 2<br>47 à 55 Vdc |
| Consumption<br>w:o POE / w POE | 15W / 132,3W 8 ports .3af<br>/210W 4p.3af + 4p. 2at | 12W / 247W 16p. 3af | 30 / 420W |
| ***Performances*** | | | |
| MAC address table size | 8192 | 8192 | 8192 |
| Packet buffer memory (Bits) | 2M | 2M | 2M |
| ***Network Redundancy*** | | | |
| STP/RSTP | YES | YES | YES |
| MSTP | YES | YES | YES |
| Alpha Ring < 15ms | YES | YES | YES |
| ***Management and network protocols*** | | | |
| VLAN | Port VLAN,tagging 802.1q C-VLAN, GVRP | | |
| QoS 802.1p | 802.1p with 4 priority queues | | |
| IGMP | Multicast with IGMP Snooping V1,V2 et V3 | | |
| Access security | 802.1x per port with Radius client | | |
| Flow control | 802.3x | | |
| Rate access limiting | Ingress/Egress per ports per 62kbps step | | |
| Other protocols | Truncking/MAC address, Port Mirroring, NTP client and relay | | |
| Ethernet | 10/100Mbps Full/Half Duplex, 1000Mbps Full Duplex, | | |
| Management | Console port, Telnet, SNMP V3, RMON, | | |

# ‘’Carrier Ethernet’ POE switches Layer 2 & 3 manageable


| MODELS | SWM-8TPS-2UCB-S22 | SWM-24TPS-2UCB-S22 | SWM-24GPS-4GSF-ACS48 | SW3G-20TGPS-4UCB-AC |
|---|---|---|---|---|
| MANAGEMENT | Layer 2 | | Layer 2 | Layer 3 |
| *Environnements* | | | | |
| Port capacity | 8 FE + 2 GE | 24FE + 2 GE | 24 GE + 4 GX | 24 GE + 4 10GE |
| Working temperature | -10° to -60°C | -10° to -60°C | -10° to -50°C | -10° to -50°C |
| Industrial compliance | CE, FCC | | | |
| *Ethernet ports* | | | | |
| 10/100BaseT POE PsE 802.3af | 8 at 15,4W | 24 at 15,4W | | |
| 10/100BaseT POE PsE 802.3at | 4 at 30W | 12 at 30W | | |
| 10/100/1000BaseT POE PsE 802.3af | | | 24 at 15,4W | 20 at 15,4W |
| 10/100/1000BaseT POE PsE 802.3at | | | 24 at 30W | |
| UPLINK | 2 universal combo ports 10/100/1000BaseT and SFP 100FX or 1000SX/LX/ZX | 2 universal combo ports 10/100/1000BaseT and SFP 100FX or 1000SX/LX/ZX | 4 SFP 1000SX/LX/ZX | 4 universal combo ports 10/100/1000BaseT and SFP 100FX or 1000SX/LX/ZX |
| Optional | | | | 2 x 2 XFP 10GE modules |
| *Physical / Electrical* | | | | |
| Casing | metal 19" 1U Fan | metal 19" 1U Fan | metal 19" 1U Fan | metal 19" 1U Fan |
| Dimensions W x D x H mm | 300 x 240 x 44 | 440 x 340 x 44 | 440 x 400 x 44 | |
| Power supply 2 are redundant | version -A-S22 : AC 176 at 264V version -D-S22 : DC -36 at -72Vcc | | Internal AC 176 at 264V 500W optionnal +500W AC power | Internal AC 176 at 264V 500W optionnal +500W AC power |
| Consumption w:o POE / w POE | / 124W | / 400W | /720W | /420W |
| *Performances* | | | | |
| MAC address table sizes | 8K | | 16K | 16K |
| Packet buffer memory (Bits) | 2M | | 2M | 2M |
| Troughput/Switch fabric | | | 42Mbps / 56Gbps | |
| *Network Redundancy* | | | | |
| STP/RSTP | YES | | YES | YES |
| MSTP | YES | | YES | YES |
| Alpha Ring < 15ms | ESR Ring <50ms | | R-Ring <50ms | R-Ring <50ms |
| *Management and network protocols* | | | | |
| Routing | - | | Static routing, VLAN routing | Static routing, VLAN routing, RIP 1&2, OSPF v2, BGP v4 |
| VLAN | Port VLAN,tagging 802.1q C-VLAN, S-VLAN, GVRP, VLAN protection 1:1 and 1:n | | VLAN per port and tagging 802.1q , S-VLAN/C-VLAN Q-in-Q and GVRP | VLAN per port and tagging 802.1q , S-VLAN/C-VLAN Q-in-Q and GVRP |
| QoS 802.1p | 802.1p with 4 priority queues | | Port and tag 802.1p, IPV4 ToS/DiffServ, IPV6 Traffic Class, 8 priority queues | Port and tag 802.1p, IPV4 ToS/DiffServ, IPV6 Traffic Class, 8 priority queues |
| IGMP | Multicast with IGMP Snooping V1,V2 et V3 | | Multicast IGMP Snooping V1,V2 and V3, Proxy IGMP and IGMP fast leave | Multicast IGMP Snooping V1,V2 and V3, Inter-VLAN multicast duplication, PIM-SM |
| Access security | 802.1x per port with Radius client 20 MAC address set up | | 802.1x per port with Radius Client, ACL ... see datasheet | 802.1x per port with Radius Client, ACL ... see datasheet |
| Flow control | 802.3x | | | |
| Rate access limiting | Ingress/Egress per ports by 62kbps step | | | |
| Other protocols | Truncking/MAC address, Port Mirroring 1:1 and 1:n, SNTP client and relay | | DHCP server/relay and option 82, LACP truncking, NTP client and relay... | DHCP server/relay and option 82, LACP truncking, NTP client and relay... |
| Ethernet | 10/100Mbps Full/Half Duplex, 1000Mbps Full Duplex, Auto-negociation, MDI/MDIX, Wire-Speed tranfert , | | 10/100Mbps Full/Half Duplex, 1000Mbps Full Duplex, Auto-negociation, MDI/MDIX | 10/100Mbps Full/Half Duplex, 1000Mbps Full Duplex, Auto-negociation, MDI/MDIX |
| Management | Console port, Telnet/SSH, SNMP V3, RMON, Web browser, TFTP and CLI | | Over console port or LAN or WAN with Telnet/SSH, SNMP V1/V2/V3, RMON, Web browser*, TFTP and CLI | Over console port or LAN or WAN with Telnet/SSH, SNMP V1/V2/V3, RMON, Web browser*, TFTP and CLI |
| MEF and cross-administration | | | | MEF 9, MEF 14, OAM Ethernet , 802.3ah, Y.1731, IEEE802.1ag |

# Ethernet /Gigabit Ethernet/10 Gigabit Media conversion copper/fiber/fiber

*CXR manufactures a large range of fiber optic converters, multiplexers… particularly for TDM, analogue, legacy and Ethernet/Gigabit/10Gigabit media converters from "Copper to Fiber" or "Fiber to Fiber" as pure converter or with switching for rate adaptation. They are used as interfaces adaptation, modem over fiber, fiber booster or transponder from standard wavelength to CWDM or DWDM. We supply Media Converters:*

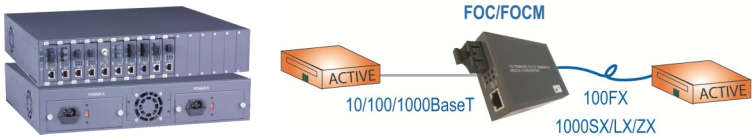
- *Automatic or Web/SNMP managed converters and chassis of conversion*
- *Transparent to 9K Jumbo Frame or with VLAN/Q-in-Q tagging*
- *Link alarm in case UTP or fiber is coming down*
- *Standard, Industrial and hardened*
- *Fixed or SFP fiber transceivers MM, SM up to 200km, CWDM and DWDM*

**Ethernet Copper**
10BaseT
100BaseT
1000Baset
10G UTP

**Ethernet Fiber**
10FL
100FX
1000SX/LX/ZX
10G-SR/LR/ER/ZR

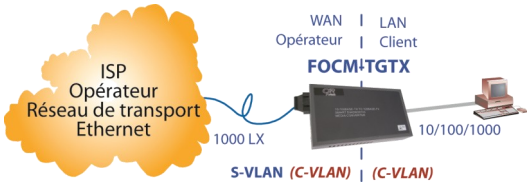
2 fibers
WDM
CWDM
DWDM

*Media and rate conversions*




*LAN extension over fiber optic*

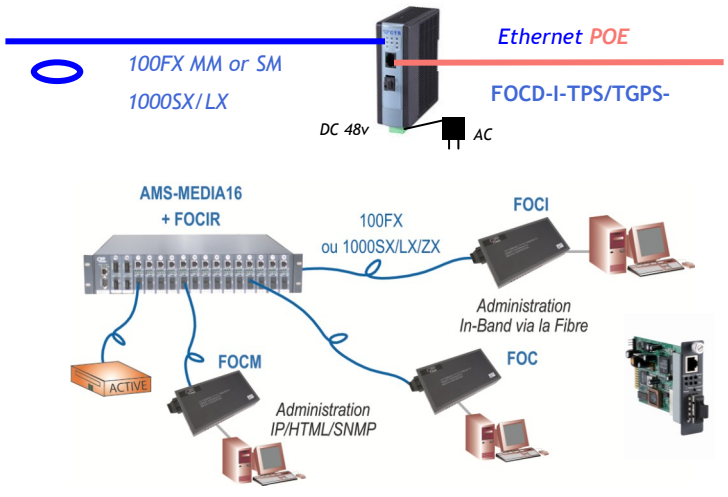

*Gigabit Ethernet transport network- Q-in-Q and Ethernet demarcation, OAM*




*Booster, CWDM/DWDM transponder for Ethernet fiber*



*Industrial/Hardened media converters standard or with POE PSE*




## - COPPER to FIBER -

**FOC-TTX-FX**
Automatic converter,
10/100Baset to 100FX or 100Bt/100FX

**FOC-TGTX-GSX/GLX or SFP**
Automatic converter,
10/100/1000Baset to 1000SL/LX/ZX
Fixed Fiber MM, SM to 100km or
SFP simple, WDM, CWDM, DWDM

**FOC-2x10G-SFPP**
Automatic converter,
10G to 10G with 2 SFP+

**FOCM-TTX-FX or SFP**
Web/SNMP manageable converter
10/100Baset to 100FX or 100Bt/100FX

**FOCM-TGTX-GSX/GLX or SFP**
Web/SNMP manageable converter
10/100/1000Baset to 1000SL/LX/ZX
VLAN & Q-in-Q tagging, filter, rate limiting, RMON

**RACK-MEDIA16**
Chassis for 16 FOC, FOCFF,FOCM.

## - FIBER to FIBER -

**FOCFF-USFP-USFP**
Automatic converter dual SFP,
100FX to 100FX and 1000FX to 1000FX

**FOS-25G-SFP-SFP**
3R optic conversion from 10Mbps to 2,5Gbps, dual SFP, conversion, booster, transponder for CWDM/DWDM.

## - INDUSTRIAL/HARDENED -

**FOCD-I-TTX-FX**
**FOCD-I-TGX-SX/LX**
Din-rail Industrial converter
-10 to +60°C

**FOCD-I-TPS-FX**
**FOCD-I-TPG-SX/LX**
Din-rail Industrial converter
POE source 802.3at 30W

**FOCD-H-TTX-FX**
**FOCD-H-TGX-SX/LX**
Din-rail Hardened converter
-40 to +75°C

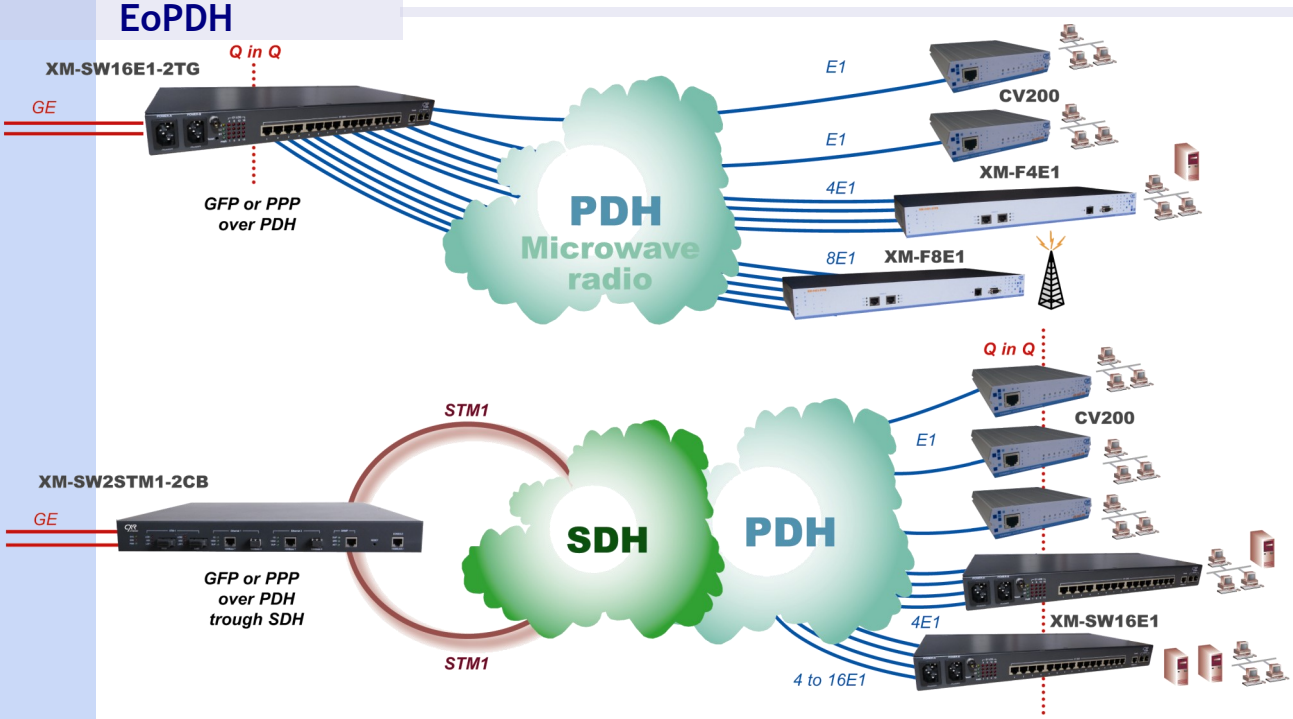
**AMS-MEDIA16-SNMP**
Web/Telnet/SNMP Chassis for
16 FOCIR card

**FOCIR-TTX-FX**
**FOCIR-TGTX-GSX/GLX**
Converter cards,
10/100Baset to 100FX or
10/100/1000Baset to 1000SL/LX/ZX
MM, SM to 100km, WDM, CWDM

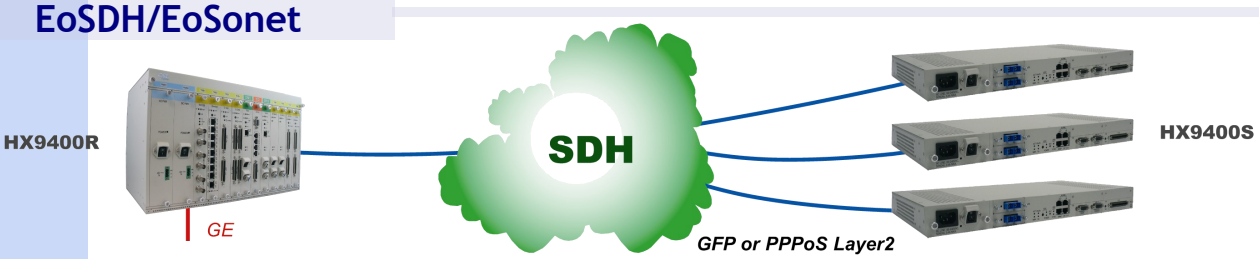
# Carrier Transport Ethernet Network
# EoPDH - EoSDH/Sonet - EFM-Gshdsl - HVLAN - EDD

*CXR supplies solutions for Carrier Ethernet Network and services. These run over multiple infrastructures: PDH, SDH, copper DSL, fiber or Ethernet backhaul. These solutions are used by Telco in low density area with mix accesses or by Utilities, Transportation or Defense infrastructures to develop implement networks.*
*The deployment of Q-in-Q is provided by commissioning EDGE devices. The Hierarchical-VLAN is federating bandwidth of central backbone with low administration costs.*
*CXR launch a new range of switches with Ethernet Demarcation Device (EDD) function. This Edge equipments support SyncE and PTP 1588v2 slave which give to EDD a high level of precision to synchronize the clock and phase of connected CESoPSN equipment, IP-BTS 3.5G or 4G/LTE.*

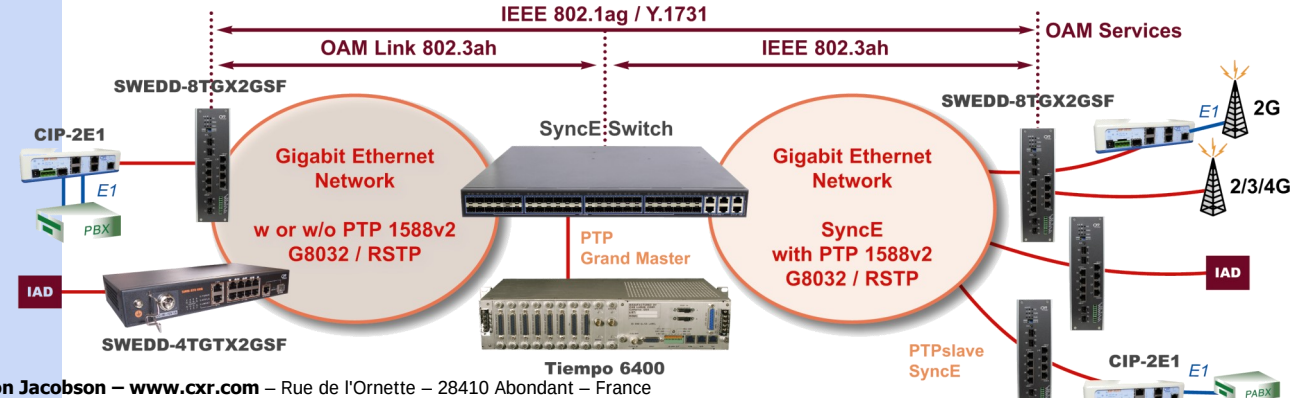
## EoPDH




## EoSDH/EoSonet




## Carrier Ethernet / EDD

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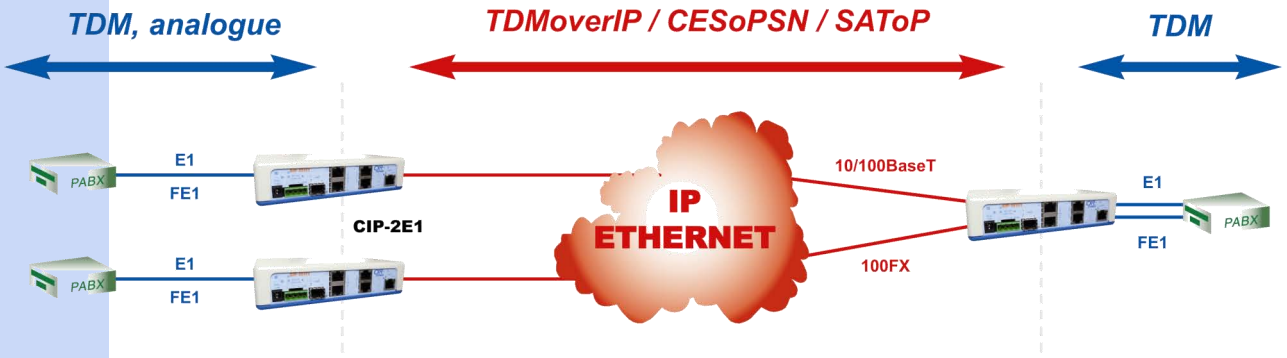
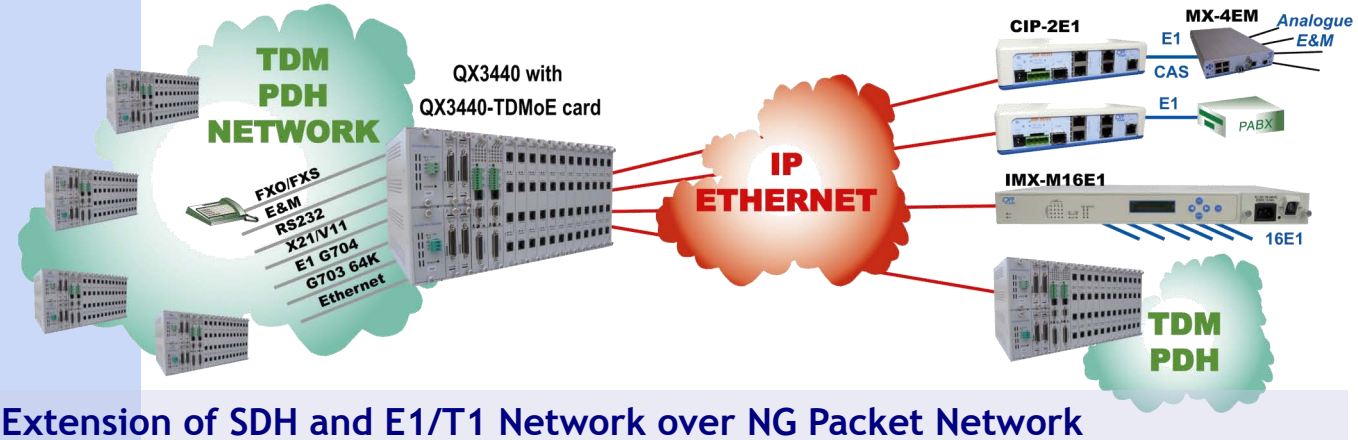
# E1/T1, E3/DS3, STM1/STM4 Pseudo-Wire Transmission encapsulated over IP/Ethernet

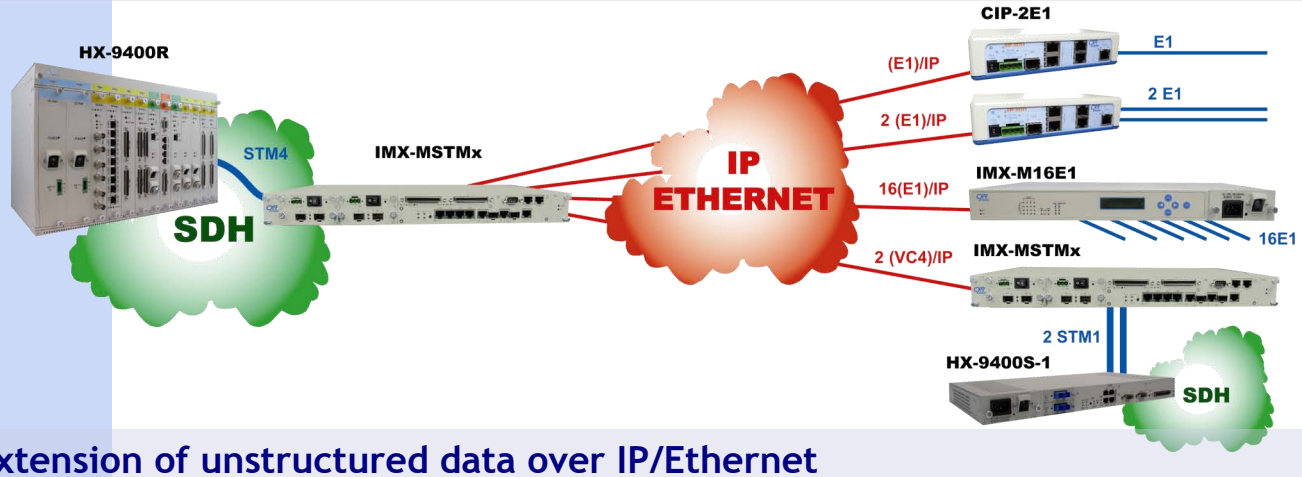
*CXR supplies solutions to interconnect PDH and SDH nodes over Ethernet backhaul with synchronization of distant isolated devices. These solutions carry over New Generation Packet Network synchronous TDM applications and low latency with high reliability structures which are used in Utilities, Transportation or Defense areas.*
*Based on SAToP, CESoPSN/E, TDM over IP protocols according to RFCs CXR offer a large range of devices from small CPEs to large concentration systems or integrated cards in PDH/SDH multiplexer compatible with other vendor.*
*We carry in Pseudo-Wire over Ethernet/IP unframed/framed E1/T1 for voice E1-CAS, E1-R1, ISDN E1/T1 PRI, for 2G/3G+ E1 A-Bis, A-Ter, E1/T1 ATM, E3, DS3 and SDH STM1 or STM4.*
*We provide Point to Point or Multipoint transport and save additional cross connect or SDH multiplexers.*




## Extension of TDM, interconnexion of PDH Networks over IP/Ethernet




## Extension of SDH and E1/T1 Network over NG Packet Network




## Extension of unstructured data over IP/Ethernet

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