KONUENDO NETWORKING

Consist Switch

19 ports 6xGbE+13xFE - PoE+ - Gen2

VDS Rail
The onboard networking company



Preliminary image, for reference only

Highlights

- **Layer 2 managed switch with Layer 3 services**
- **19 Ethernet ports - 6xGbE+13xFE ports**
- **Rolling-Stock Applications**
- **EN 50155 compliant**
- **IEC 62443-4-2 certified**
- **Designed for harsh environmental conditions**
- **Wide operational temperature up to -40°C ÷ +70°C**
- **Wide operating voltage range 24 ÷ 110 VDC**
- **Up to IP65 rated**
- **Power over Ethernet PoE+**
- **Up to two hardware bypasses for maximum reliability**

- **TTCMP Network Toolkit**
  - **Fast network design**
  - **First set-up and commissioning semplification**
  - **Maintenance optimization**

The **19 ports Gigabit Ethernet Consist Switch** (Gen2) is a Gigabit/ Fast Ethernet Layer 2 managed switch **EN 50155 compliant**, specifically designed for network applications in Rolling-Stock environments.

Besides providing wire speed layer 2 forwarding, it supports also **Layer 3 capabilities** allowing IPv4 unicast and multicast routing among different VLANs. Its purpose is to enable the implementation of network topologies in a train.

The Consist Switch is **IEC 62443-4-2 certified**, ensuring robust cybersecurity.

The Consist Switch has **six (6) 1000BASE-T ports and thirteen (13) 100BASE-TX ports**.
Up to two (2) pairs of Gigabit Ethernet ports can be optionally equipped with **bypass function**.
Two (2) Gigabit Ethernet and Thirteen (13) Fast Ethernet ports can be optionally equipped with **PoE+** capability.

The Consist Switch provides advanced traffic switching capabilities, including **support for VLANs, IGMP, Spanning Tree protocols (STP/RSTP)** and the possibility to apply **Quality of Service (QoS) policies**. Layer 3 extensions include **inter-VLAN routing** with packet filtering together with NAT. OSPF and RIP dynamic protocols are also supported. IPv4 router redundancy can be provided through standard VRRP protocol. The bypass feature makes the device completely transparent to the network in case of power loss or failure, thus avoiding or reducing the impact of possible local dropouts or malfunction on network performance.

Designed to operate in **harsh environmental conditions typical of Rolling-Stock applications**, the Consist Switch is fully EN 50155 compliant and provides the highest level of reliability and robustness required by the railway industry.

Besides the standard features provided by this class of devices, the Consist Switch provides **advanced software facilities for on-board network discovery and configuration**. The device includes a sophisticated programming interface and is capable of completely **auto-configure** itself from an abstract project definition right after power on. Both these features dramatically ease maintenance activities and provide smart tools for fine-grained control over device operations and configuration.

Technical specifications

- Six (6) 10/100/1000BASE-T(X) Ethernet ports - two (2) of them with optional PoE+ capability
- Thirteen (13) 10/100BASE-T(X) Ethernet ports - all with optional PoE+ capability
- M12 circular connectors for Ethernet ports
- M12 circular connector for power supply port
- IPv4 protocol supported
- Up to two (2) hardware bypasses for maximum reliability (option)
- Spanning tree (STP 802.1D) and Rapid Spanning Tree (RSTP 802.1w)
- Link aggregation protocol (LACP 802.3ad)
- Up to 4094 802.1Q VLANs
- DHCP option 82 handling
- Advanced and flexible per-port DHCP server
- IGMP versions 1, 2 and 3 snooping
- SNMP v1, v2c, v3 device management
- Extended RMON counters
- Link Layer Discovery Protocol (LLDP 802.1ab)
- 802.1X port authentication
- RADIUS authentication
- DSCP/802.1p Class of Service
- Static IPv4 unicast and multicast routing
- OSPF and RIP dynamic routing protocols
- VRRP v3 Router Redundancy
- Network Address Translation (SNAT, DNAT and R-NAT)
- Packets filtering
- Eight (8) output hardware queues for each port
- Strict priority or weighted (WRR) scheduler
- Ingress/egress/broadcast traffic rate limiting
- In-band (SSH) and out-of-band (console) CLI interface for device management
- In-band and out-of-band firmware upgrade
- Fallback firmware images for maximum reliability
- Train Topology and Configuration Management Protocol (TTCMP©) technology to support project-based device configuration management, including network discovery and auto-configuration

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Technical Specifications

PHYSICAL DATA

System status indicators	**8 LEDs**
Fast Ethernet connectors	**M12, female, 4-ways, D-coding**
Gigabit Ethernet connectors	**M12, female, 8-ways, X-coding**
Power supply connector	**M12, male, 5-ways (4+PE), K-coding**
Maintenance port connector	**M12, female, 8-ways, A-coding**
Power supply voltage (insulated)	**Nominal voltage 24 ÷ 110 Vdc** **Range according to EN 50155** **Nominal voltage 24/32/48/64 Vdc** **Range according to IEEE Std 1476-2000 (R2008)**
Interruption voltage supply class	**S2, according to EN 50155**
PoE class	**0, 1, 2, 3 and 4, (max 30W per port), according to IEEE 802.3at Type-2**
PoE budget (option)	**100 W** **derating of 1 W/ °C @ > 55 °C**
Total power consumption	
noPoE version	**40 W max**
PoE version	**180 W max**
Overall dimensions (W x H x D)	
noPoE version	**248 x 240 x 51 mm (without connectors)**
PoE version	**248 x 240 x 88 mm (without connectors)**
Weight (max.)	
noPoE version	**3.2 Kg**
PoE version	**4.6 Kg**
Operating temperature	
Standard	**-25 °C ÷ +70 °C (+85 °C for 10 min. according to EN 50155 class OT3 with extended operating temperature ST1)**
Optional	**-40 °C ÷ +70 °C (+85 °C for 10 min. according to EN 50155 class OT4 with extended operating temperature ST1)**
Relative humidity (non-condensing)	**0 % ÷ 95 %**
Storage temperature	**-40 °C ÷ +85 °C**
Color codes	**RAL 7016 (frame)** **Pantone 425C (front panel)**
Degree of protection	
Standard	**IP40**
Optional	**IP65**
Mechanical enclosure	**Passivated aluminium**

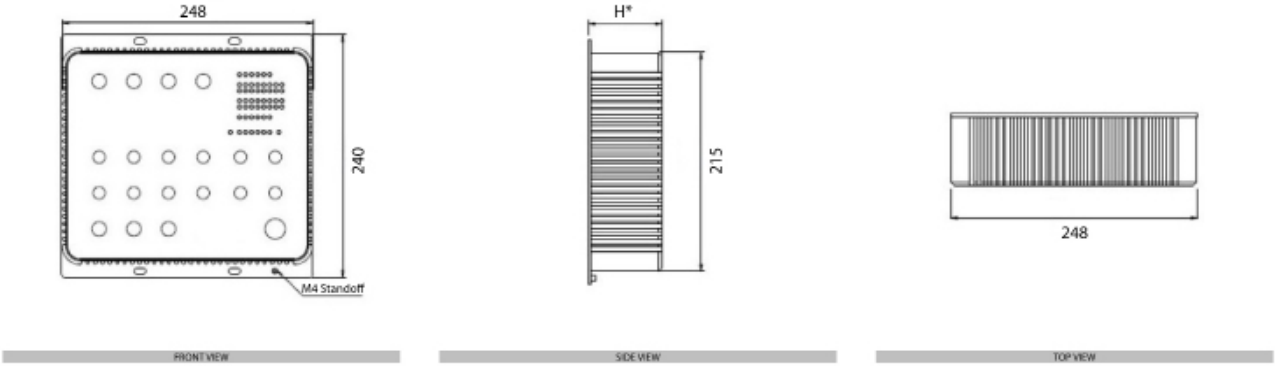
APPROVALS / COMPLIANCE

EN 50155	**Railway Applications (Electronic equipment used on rolling stock)**
EN 50121-3-2	**Electromagnetic compatibility rolling stock apparatus**
IEC 60068-2-1	**Environmental testing: Tests - Test Ad: Cold**
IEC 60068-2-2	**Environmental testing: Tests - Test Bd: Dry heat**
EN 60068-2-30	**Environmental testing: Tests - Test Db Variant 2 – Damp heat**
EN 61373	**Shock & Vibration - Category 1 class B**
EN 50124-1	**Insulation coordination**
EN 45545-2	**Fire & Smoke**
IEC 62443-4-2	**Security for industrial automation and control systems - Part 4-2: Technical security requirements for IACS components** *Available from FW version: 8.0.0*

INTERNET WORKING STANDARDS

IEEE 802.3	**Fast Ethernet (10/100BASE-T(X))** **Gigabit Ethernet (10/100/1000BASE-T(X))**
IEEE 802.1Q	**Tagged VLANs**
IEEE 802.1D	**Spanning Tree Protocol**
IEEE 802.1w	**Rapid Spanning Tree protocol**
IEEE 802.1X	**Port-based network access control**
IEEE 802.1AB	**Link Layer Discovery Protocol (LLDP)**
IEEE 802.3ad	**Link Aggregation Protocol (LACP)**
RFC 2328	**OSPF v2**
RFC 2453	**RIP v2**
RFC 3768	**VRRP v2**
RFC 5798	**VRRP v3**

Wall Mounting



H*: see overall dimensiomns specification

Ordering codes

Part Number **NODC19xxxx**

Description **NC-CS19-6G13F-xxxx-xB-IPxx-Tx-xx**

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