Product Brief HY104-DSL/FO

Product outline
- State-of-the-Art technology for the specific tasks in smart grids, in future-proof telecontrol and in mission-critical networks
- Ideal transmission technology for IEC 60870-5-101, -104 and IEC 61850
- Existing, with serial protocols communicating RTUs can further be operate and connected with the serial tunnel or the protocol converter function
- DSL connection via copper pair with a data rate of 192 to 15,000 kbps
- Automatic rate adaption to the line quality
- Up to 25 km transmission distance (at 0.8 mm wire diameter)
- Monitoring of signal quality on the copper line
- Optical connection with 100 Mbps
- Up to 180 km transmission distance on the optical fibre
- Monitoring of signal quality on the optical fibre
- Ethernet switch with QoS, Spanning Tree, and VLANs
- Broadcast storm control
- Support of redundant network structures via rings and/or parallel paths
- Remote management, configuration, and monitoring via IP
- Security / RADIUS / IEEE 802.1X
- Access Control Lists (ACLs) for configuration of packet filters (Firewall) and QoS classmaps (dynamic Class-of-Service assignment for packets)
- Optional Inter-VLAN routing and multiple IP addresses (Multihoming)
- TraceMAC to find address locations in Layer-2 networks: automatic search of hardware MAC addresses
- Portable configuration stick for backup of configuration and easy unit exchange
- Two RS-232 interfaces for configuration and/or conversion / transmission (tunneling) respectively of serial telecontrol protocols
- Configurable alarm contact
- Integrated overvoltage protection
- Low power consumption, extended temperature range, no mechanical components

Optional device functionality
- RS-485 process interface
- Power over Ethernet (PoE) with overall feeding power 36 W, 54 W, 72 W, 108 W or 280 W
- Remote power feeding over DSL for usage as repeater
- Redundant power supply over second power plug

Supported Protocols (Selection)
- Ethernet according to IEEE 802.3 / IEEE 802.3u (10Base-T / 100Base-TX)
- SDSL according to ETSI TS 101 524 and SHDSL according to ITU-T G.991.2
- IEC 60870-5-101 and -104 integration and conversion
- Telnet, Secure Shell (SSH) and Web interface for remote management
- Trivial File Transfer Protocol (TFTP) for transmission of firmware and configuration
- Simple Network Management Protocol (SNMP)
- Simple Network Time Protocol (SNTP) for time synchronization
- Syslog for central logging of events
- Link Layer Discovery Protocol (LLDP) according to IEEE 802.1AB for neighbor detection
- Hypertext Transfer Protocol (HTTP) for easy configuration using the integrated webserver
- Rapid- and Multiple-Spanning-Tree-Protocol according to IEEE 802.1D and IEEE 802.1Q
- Network access control according to IEEE 802.1X

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HY104-DSL/FO – Technical Data

Switch
- Non-Blocking Wire-Speed Switch
- QoS by Port, IEEE802.1p und TOS/DS
- VLANs (IEEE 802.1Q)
- Self learning, 2k MAC-Addresses
- Mode Store & Forward, Transparent Bridge

Supported Standards & Protocols
- IEC 60870-5-101 / -104 Telecontrol equipment and systems - transmission protocols
- IEEE 802.1AB-2005 Link Layer Discovery Protocol
- IEEE 802.1Q-2011 Multiple Spanning Tree Protocol
- IEEE 802.1p Class of Service, IEEE 802.1Q-2005 Virtual Local Area Network
- IEEE 802.1X-2004 Port based Network Access Control
- RFC 768 UDP, RFC 791 IP, RFC 792 ICMP
- RFC 793 TCP, RFC 826 ARP, RFC 854 Telnet
- RFC 1058 RIP, RFC 1122 Req., RFC 1123 Hosts
- RFCs 1155 - 1157 Simple Network Management Protocol - SNMPv1
- RFCs 1901 - 1908 Community-based Simple Network Management Protocol - SNMPv2c
- RFCs 3410 – 3414, RFC 3826 SNMPv3
- RFC 1213 Management Information Base for Network Management of TCP/IP-based Internets: MIB-II (replaces RFC 1158)
- RFC 2863 Interface MIB (replaces RFC 2233)
- RFC 2891 RMON MIB (replaces RFC 1757)
- RFC 4188 Bridge MIB (replaces RFC 1493)
- RFC 4363 Q-Bridge MIB
- IEEE 802.1AB-2005 LLDP MIB
- RFC 1350 TFTP Rev. 2 (replaces RFC 783)
- RFC 1519 Classless Inter-Domain Routing
- RFC 1812 Req. for IP Version 4 Routers
- RFC 2616 HTTP/1.1 (replaces RFC 2688), W3C HTML 4.01 / CSS Level 2
- RFC 2388 RRPR
- RFC 2453 RIP Version 2 (replaces RFC 1723 and RFC 1388)
- RFC 5424 The Syslog Protocol
- RFC 4250 - RFC 4254 The Secure Shell, SSHv2
- RFC 1034, RFC 1035 Domain names (client)
- RFC 2131, RFC 2132 DHCP/BOOTP (client)
- RFC 3046, RFC 5010 DHCP Relay Agent

Interfaces

<table>
<thead>
<tr>
<th></th>
<th>Ethernet</th>
<th>4 Ports 10Base-T/100Base-Tx</th>
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<tbody>
<tr>
<td></td>
<td>Fast Ethernet</td>
<td>IEEE 802.3-2012 Cl. 14</td>
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<td>Auto-Negotiation</td>
<td>IEEE 802.3-2012 Cl. 25</td>
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<td>Auto-MDI/MDI-X</td>
<td>IEEE 802.3-2012 Cl. 40</td>
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<td>Flow-Control</td>
<td>IEEE 802.3-2012 An. 31B</td>
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<td>(optionally: Power</td>
<td>over Ethernet IEEE 802.3at-2009)</td>
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- Optical: 1 SFP transceiver slot
  - (Small Formfactor Pluggable)
  - INF-8074i multi-source agreement (MSA)

- SHDSL: 1 DSL interface for two-wire copper line

- EFM / 2Base-TL IEEE 802.3-2012 Cl. 63
- ETSI SDSL.bis (ETSI TS 101 524 V1.2.2)
- ITU G.991.2-2004 HDLC for Packet, G.shdsl.bis
- ITU G.994.1.1 G.hs

- Serial: 2 EIA RS-232 interfaces
  - (optionally: EIA RS-485)

Housing
- Dimensions (WxHxD): 68 x 99 x 114,5 mm
- Weight: 330 g
- Top-hat rail mounting
- LED-Indication at the front panel
- All connections realized with plug-in connectors

Power supply
- Power consumption: +24…+60 VDC
- Current: 6 W (typ)
- 500 mA (peak)

Safety
- EN 60950-1

Environment
- Operating temperature: -40...+80 °C
- Relative humidity (non-condensing): 5...95 %
- Shock and Vibration: EN 300 019-2-8 V2.1.2

Electromagnetic compatibility
- Emission: EN 55022
- Radio interference voltage: Class A
- Radio interference field strength: Class A
- Railway applications: EN 50121-4
- Electrostatic discharge: EN 61000-4-2
- 8 kV air, 6 kV contact: EN 61000-4-2
- Electromagnetic immunity: EN 61000-4-3
- 80 MHz to 3 GHz: Class A
- Surge and Burst immunity: Class A
- Surge 4 kV (DSL: 6 kV): EN 61000-4-4
- Surge 4 kV: EN 61000-4-5
- Burst 4 kHz: EN 61000-4-5
- Conducted disturbances: EN 61000-4-6
- 10 V, 0.15 MHz to 80 MHz: 80 % AM 1 kHz
- Magnetic field immunity: EN 61000-4-8
- Mains frequency immunity: EN 61000-4-16
- 300 V: Class A
- Ripple on d.c. input power port: Class A
- Immunity osc. wave: Class A

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