Product Brief HY104-FO2

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
- 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
- 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-FO2 – 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 Classless Inter-Domain Routing
- RFCs 1901 - 1908 Community-based Simple Network Management Protocol - SNMPv1
- 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 2819 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 2068), W3C HTML 4.01 / CSS Level 2
- RFC 2388 VRRP
- 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>Ethernet</th>
<th>4 Ports 10Base-T/100Base-Tx</th>
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<tbody>
<tr>
<td>Fast Ethernet</td>
<td>IEEE 802.3-2012 Cl. 14</td>
</tr>
<tr>
<td>Auto-Negotiation (NWAY)</td>
<td>IEEE 802.3-2012 Cl. 25</td>
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<tr>
<td>Auto-MDI/MDI-X</td>
<td>IEEE 802.3-2012 Cl. 29</td>
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<tr>
<td>Flow-Control</td>
<td>IEEE 802.3-2012 An. 31B</td>
</tr>
<tr>
<td>(optionally: Power over Ethernet IEEE 802.3at-2009)</td>
<td></td>
</tr>
<tr>
<td>Optical</td>
<td>2 SFP transceiver slots</td>
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<tr>
<td>(Small Formfactor Pluggable)</td>
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<tr>
<td>INF-8074i multi-source agreement (MSA)</td>
<td></td>
</tr>
<tr>
<td>Serial</td>
<td>2 EIA RS-232 interfaces</td>
</tr>
<tr>
<td>(optionally: EIA RS-485)</td>
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</tbody>
</table>

Housing
- Dimensions (WxHxD) | 68 x 99 x 114,5 mm |
- Weight | 310 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
- Operating temperature | -40…+80 °C |
- rel. humidity (non-condensing) | 5…95 % |
- Shock and Vibration |
- ETSI EN 300 019-2-8 V2.1.2

Electromagnetic compatibility
- Emission |
- Radio interference voltage |
- Radio interference field strength |
- Railway applications |
- EN 50121-4 |
- EN 61000-4-2 |
- Criteria A |
- EN 61000-4-3 |
- Criteria A |
- EN 61000-4-4 |
- Criteria A |
- EN 61000-4-5 |
- Criteria A |
- Conducted disturbances |
- 10 V, 0.15 MHz to 80 MHz |
- 80 % AM 1 kHz |
- EN 61000-4-6 |
- Criteria A |
- Magnetic field immunity |
- EN 61000-4-8 |
- Criteria A |
- Mains frequency immunity |
- 300 V |
- EN 61000-4-16 |
- Criteria A |
- Ripple on d.c. input power port |
- EN 61000-4-17 |
- Criteria A |
- Immunity osc. wave |
- 2.5 kV |
- EN 61000-4-18 |
- Criteria A