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INFONETICS RESEARCH

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ML684DT Ethernet Access Device

The ML684DT Industrial Ethernet Switch from Actelis® is a small form factor Add-Drop unit enabling the delivery of symmetrical high-speed Ethernet services over existing copper and fiber infrastructure. Up to 60 Mbps of symmetrical Ethernet traffic over copper and 1 Gbps over fiber. The ML684DT offers an integrated serial server functionality supporting existing legacy devices.

Designed for Industrial, utility and traffic applications, The ML684DT takes in two fiber ports and/or four copper pairs and allows them to be split into two directions, east and west, thereby allowing multiple nodes to be connected over copper or fiber in a linear chain, RSTP/STP mesh or ERPSv2 ring configuration. Each node has full switching capabilities and can drop and add Ethernet traffic at each location while transferring the rest of the traffic through.

The ML684DT offers extremely small factor and DIN rail mounting for flexible deployment within utilities, traffic and industrial cabinets. With its superior performance, extensive functionality, high robustness and reliability, the ML684DTP Ethernet switch offers rapid service delivery and allows for complete utilization of the existing network infrastructure.

Interoperable with any standard Ethernet switch, router or hub ML684DT devices seamlessly integrate into any Ethernet network. Equipped with six 10/100Base-T Ethernet interfaces and two 100/1000Base-FX Small Form Factor (SFP) port, the ML684DT allows assignment of a service or a customer per port.

ML684DT built-in Serial Server support RS232/V.24/RS422/RS485 protocols and enable conversion of the serial bitstream to Ethernet packets with IP/VID/MAC associated with the required remote network devices. The Ethernet traffic can then be forwarded through any ML684DT Ethernet port.

The ML684DT is a hardened and robust Ethernet switch with redundant power inputs, designed for deployment in harsh environments. It complies with NEMA 4 extended temperature requirements and K.21/K.45 for extended protection against overvoltages and over-currents.

Powered by Actelis Networks' award-winning, patented EFM*plus*™ technology, the rate, reach and reliability are increased significantly using advanced Dynamic Spectrum Management (DSM) techniques. This technology provides the best rate/reach performance, most resilient fiber-quality transmission while ensuring high reliability.

The ML684DT provides 802.1q VLAN-aware wire-speed bridging, double tagging (VLAN stacking) for end-user VLAN transparency, L2 (Ethernet priority), L3 (ToS/Diff-Serv) classification with four traffic classes, ERPSv2, RSTP/STP, Link Aggregation, bandwidth monitoring, Multicast/Broadcast limiting, as well as IGMP bandwidth snooping for video distribution applications.

The ML684DT provides proactive and dynamic tools for enhanced trouble shooting and monitoring capabilities. Advanced Carrier-class EFM OAM, including 802.3ah, CFM (802.1ag) and Y.1731 (ITU), are incorporated, offering both physical link as well as service level end-to-end advanced troubleshooting mechanisms.

The MetaASSIST™ View graphical craft application and the MetaASSIST EMS multi-platform Element Management System offer in- and out-of-band management of the ML684DT. Management protocols include standard TL1 command line interface and SNMP using standard MIBs for seamless integration with third-party Network Management Systems (NMS).

Highlights

- Support for two High Speed Copper Links
- Small form factor, no fan, DIN railing
- Environmentally hardened
- Drop and Continue, RSTP/STP mesh or ERPSv2 ring
- IEEE 802.3ah Ethernet in the First Mile (EFM) 2Base-TL Solution
- Serial to Ethernet/IP conversion - RS232/V.24/RS422/RS485
- Rapid Service Deployment
- Superior Rate, Reach & Reliability
- Low Delay and Jitter for Voice and Video Transmission
- Comprehensive OAM
- Worldwide Spectral Compliancy
- FCC, UL, CE, NEMA 4

Applications

- Telemetry
- IP-based Traffic Controllers
- Smart Grid Sensors
- Dynamic Message Signs
- HD Video Cameras & Streaming
- Vehicle Detection
- Smart Parking
- Emergency Response
- Supports & Complements City Wi-Fi Access

ML684DT

Specifications

Interfaces

Ethernet (Network/User) - 8 port switch

- **10/100Base-T:** 6 ports, Connector: RJ45, Auto-MDIX
- **100/1000Base-FX:** 2 ports **Connector:** SFP Based, MSA compliant

High Speed Link (HSL) - Bonded copper pairs

- **Protocol:** IEEE 802.3ah 2Base-TL
- **Line code:** ITU-T G.991.2 rev. 2
- **Number of copper pairs:** 4, **Connector:** RJ45 x 2
- **Number of HSLs:** 1 HSL- up to 4 pairs, 2 HSLs- east/west, 2 pair each
- **Bandwidth per HSL:** 1 HSL - up to 60 Mbps; 2 HSLs up to 30Mbps
- **End-to-end Delay:** 2-4 ms (typical)
- **Spectral Compliance:** ITU-T G.991.2 annex A, B, F, G, ETSI TS 101 524 annex E, ANSI T1.417, T1.426, Per-country regulatory compliant spectral modes
- **Sealing Current:** 48 VDC/1.5mA nominal (sink)

Serial Interface/ Management (Out-of-Band)

- **Craft 1:** RS232/V.24/RS-422/RS485 for Serial Server, local management or PFU management. 10/100Base-T **Connector:** RJ45, Auto-MDIX

Management (Out-of-Band)

- **Craft 2:** Local ML Management Only **Connector:** Earphone 2.5mm connector

Alarm Contacts

- Terminal Block, 2 Input, 1 Output

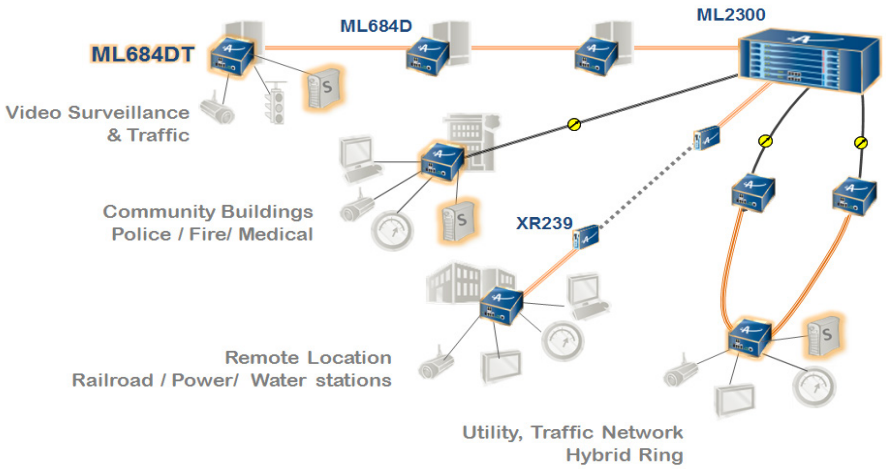
LAN Protocols

- **Dynamic Bridging:** IEEE 802.1, 8K MAC addresses
- **Discovery Mechanisms:** LLDP
- **VLAN Tagging:** IEEE 802.1Q
- **Double Tagging:** Q-in-Q
- **RSTP, STP:** IEEE 802.1d
- **ERPSv2:** G.8032 ERPSv2
- **Link Aggregation:** IEEE 802.3ad
- **Provider Bridges:** IEEE 802.1ad
- **IGMP snooping:** IGMP V1/V2
- **OAM:** IEEE 802.3ah clause 57 (EFM OAM), IEEE 802.1ag, ITU Y.1731, Ethernet loopback with MAC swap

Advanced Service Provisioning and Traffic Management

Quality of Service

- **Classes of Service:** 4
- **Scheduler:** WFQ, SP
- **Classification:** L2 802.1p/Q priorities, L3 ToS/Diff Serv



Management

Management Applications

- **EMS**: MetaASSIST EMS
- **Craft GUI**: MetaASSIST View

Protocols

- **SNMP:** V3, V2C, V1
- **IP addresses:** IPV4 and IPV6
- **Command Line Interface:** TL1, CLI
- **Remote Access:** Telnet
- **Secure Access (option):** SSH v2
- **Time Synchronization:** SNTP v3
- **Web Access:** HTTP
- **File transfer:** FTP, TFTP
- **IEEE 802.3ah EFM OAM:** Dying Gasp
- **User Authentication:** RADIUS and/or local passwords

Front Panel Indicators (LEDs)

- **Power**
- **Status**
- **Alarm**
- **MLP per modem/pair**
- **ACT (Activity) per Ethernet port**
- **LNK (Link) per Ethernet/HSL port**
- **Power A**
- **Power B**

Physical

- **Dimensions: Height:** 5.95" / 151 mm, **Depth:** 5.1" / 130 mm, **Width:** 2.3" / 58 mm
- **Weight:** 1.76 lbs / 0.8 kg
- **Mounting**: Din Rails, Wall Mount Design for top hat rail EN 50022 – 35 × 7.5, or 35 × 15 - type O / type Omega (Ω)

Power

- DC: -24/-48 VDC (20 to 57V), redundant dual inputs, 9 Watt (internal)
- AC: 90-264 VAC (External)

Environmental

- **Operating Temp.** -40° to +74°C
- **Storage Temp.** -40° to +74°C
- **Relative humidity:** Up to 95%, non condensing

Regulatory Compliance/Certifications

Metro Ethernet Forum

- CE 1.0 - MEF 9, 14

Safety

- UL 60950, CSA C22.2 60950
- EN 60950, IEC 60950

EMI(Emission):

- FCC Part 15 Class A
- ICES-003 Class A
- ETSI EN 300 386 Class A
- ETSI ETS 300 132-2
- EN 55022 Class A
- EN50155, IEC60571

EMS (Immunity):

- EN 300 386 level 3 ESD,Surge, EFT level 2 or 3
- EN 61000 - Level 3: 4-2 (ESD), 4-3 (RS), 4-4 (EFT), 4-5 (Surge), 4-6 (CS)
- EN 61000-4-8
- ITU-T K.21, K.45

CE

- EMC and Safety

Environmental

- ETSI ETS 300 019
- NEMA 4 Thermal

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