Device Level Ring (DLR)

ETHERNET NETWORK REDUNDANCY PROTOCOL

- **Layer 2 network redundancy protocol**, with recovery times below 3 milliseconds
- Transparent to upper layer protocols, such as TCP/IP
- Operates at speeds from 10 Mbit/s to 1 Gbit/s

**Supported Products**

DLR is supported by a wide range of Hirschmann and Lumberg Automation products, including:

- **OCTOPUS**: Panel mount IP67 switch with up to four Gigabit Ethernet ports and twenty four PoE+ Fast Ethernet ports supporting enhanced Security and routing features. Approvals include substation, train and hazardous location
- **RSPE**: Modular Din Rail mount IP20 switch with up to four Gigabit Ethernet ports and twenty four PoE+ Fast Ethernet ports supporting enhanced Security and routing features. Approvals include substation, train track and hazardous location
- **RSP**: Din Rail mount IP20 switch with up to three Gigabit Ethernet ports and eight Fast Ethernet ports supporting enhanced Security and routing features. Approvals include substation, train track and hazardous location
- **RSPS**: Entry level Din Rail mount IP20 switch with up to six Fast Ethernet ports with substation and train track approvals
- **RED**: Entry level Din Rail mount IP20 switch with four Fast Ethernet ports in a compact housing
- **LioN-R**: Panel mount IP67 I/O module with two Fast Ethernet ports and 16 digital channels in a compact housing
- **Industrial HiVision**: Network management software which enables secure and easy configuration of DLR parameters across multiple devices simultaneously, as well as visualization and supervision of DLR network topologies

Be certain. Belden.
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Customer Benefits

Industry Standard Protocol

Device Level Ring (DLR) is a redundancy protocol, first published in November 2008 as part of the EtherNet/IP specification. It was embedded in Rockwell Automation Integrated Architecture in 2009. The protocol is widely accepted in industrial networking.

Layer 2 Protocol for Ethernet Networks

As DLR is a purely Layer 2 redundancy protocol, it is transparent to higher level protocols based on Ethernet such as TCP/IP. So although it was designed primarily for use with EtherNet/IP, it can be used in any Ethernet network.

Rapid Redundancy

DLR will support a network ring of up to 250 nodes or switches. In a network of 50 nodes or switches, the recovery time after a failure is less than 3 ms using 100 Mbit/s connections. As a result, DLR is ideal where there is a requirement for a recovery time in the milliseconds range without duplicating data.

Multiple Topologies

Although designed as a ring protocol, DLR can be used in a linear topology, to take advantage of the protocol diagnostics without the redundancy function. It can also be deployed in combination with Spanning Tree Protocol or other redundancy protocols such as Media Redundancy Protocol (MRP), resulting in a multitude of possible topologies.

Topologies

- Redundant Coupling
- Mesh Coupling
- Hybrid Ring, Star, and Daisy Chain

Device Level Ring provides rapid fault recovery based on a simple ring network architecture.

Customers

The Hirschmann range of DLR switches is designed for customers who require the benefits of DLR running on hardened Ethernet switches which match their operational environment, from high port density DIN rail mount, to IP67 panel mount.

Applications

- Applications requiring rapid fault recovery, without permanent data duplication
- Applications requiring a simple network architecture
- Applications requiring a high level of resilience and robustness

Markets

Factory automation, power and utility industries, discrete processing, water and wastewater, transportation, and vertical manufacturing