



## DCE/2178LRE SERIES

### Long Reach Ethernet Extender (LRE)

The DCE 2178LRE is a Long Reach Ethernet Network Extender (LER) designed to provide bonded, high-speed services over SHDSL on existing copper infrastructure using standards based on LRE (Ethernet in the First Mile) technology (2Base-TL). 2178LRE, also known as IEEE 802.3ah, is a collection of protocols specified in IEEE 802.3, defining Ethernet in access networks, i.e. first or last mile. With Wide, Metro and Local Area Networks already standardized, 2178LRE allows a continuous Ethernet network across the globe, eliminating non-native transports such as Ethernet over ATM from access networks. 2178LRE also addresses other issues, required for mass deployment of Ethernet services, such as operations, administration & management (OAM) and spectral compatibility with existing technologies such as voice, ADSL, VDSL and SHDSL. The DCE/2178LRE is a bridge mode modem that delivers Ethernet services with symmetrical bandwidth at rates up to 22.8Mbps with four bonded copper pairs. This "Pure Ethernet" solution provides a seamless integration into today and tomorrow's networks. The modem operates in point-to-point connections between remote office and enterprise headquarters, providing business-class Ethernet service at symmetrical high-speed connectivity that is ideal for small-to-medium enterprises.

#### Features

- Extends Ethernet services to sites with existing copper infrastructure
- LRE Bonding (PAF, PME Aggregation Function) up to 22.8Mbps (4 pairs)
- Flexible configuration as CPE or CO
- Supports LRE OAM complying with IEEE 802.3ah
- Low Delay, Jitter and Packet Loss for delay sensitive applications
- Comprehensive and easy OAM&P functions for provisioning and management
- QoS feature for guaranteed Ethernet service
- Web-based GUI for setup, configuration and management
- Menu-driven interface for local control via console or telnet
- Password protected management and access control list for administration
- Supports firmware upgrade via web

Typical Ranges (26 AWG)

1-pair	2-pair	4-pair	Data Rate [kbps]	2-wire		4-wire		4x2-wire	
				[km]	[mi]	[km]	[mi]	[km]	[mi]
			192	8	4.9	8	4.9	8	4.9
			512	6.4	3.9	6.7	4.1	6.7	4.1
			1536	5.7	3.5	6	3.7	6.5	4
			2048	5.1	3.1	5.7	3.5	6.4	3.9
			4096	3.9	2.4	5.1	3.1	5.7	3.5
			4608	3.5	2.1	5	3	5.5	3.4
			5696	2.9	1.8	4.6	2.8	5.1	3.1
			11392	---	---	2.9	1.8	4.6	2.8
			17088	---	---	---	---	3.5	2.1
			22784	---	---	---	---	2.9	1.8

## Specifications

Ports	<ul style="list-style-type: none"> <li>Connector : RJ45, 8 pins</li> </ul>
WAN Interface	<ul style="list-style-type: none"> <li>SHDSL.bis: ITU-T G.991.2 (2004) Annex AF/BG</li> <li>Encoding scheme: 16-TCPAM, 32-TCPAM</li> <li>2BASE-TL, 64/65-octet encoding</li> <li>LRE bonding (IEEE 802.3ah PAF)</li> <li>Maximum data rate is 22.8Mbps for 8-wire mode (5.7Mbps/Port x 4Ports=22.8Mbps)</li> <li>Impedance: 135 ohms</li> </ul>
LAN Interface	<ul style="list-style-type: none"> <li>Four RJ45 Connectors</li> <li>4-ports switching hub</li> <li>10/100 Base-T auto-sensing and auto-negotiation</li> <li>Auto-MDI/MDIX (Auto-Crossover)</li> <li>802.1d Transparent Bridging</li> </ul>
QoS	<ul style="list-style-type: none"> <li>Ingress Rate control</li> <li>Egress Traffic shaping</li> <li>Classification based on Port Base / VLAN Tag / DSCP</li> <li>4 Priority Queues</li> <li>WRR(Weighted round-robin)/ BE(Best Effort) / SP(Strictly Priority)</li> </ul>
VLAN	<ul style="list-style-type: none"> <li>802.1Q Tag-Based VLAN</li> <li>Port-Based VLAN</li> <li>Port-Based Q-in-Q</li> <li>Priority Re-mapping</li> <li>VLAN Trunk mode</li> </ul>
Management	<ul style="list-style-type: none"> <li>Easy to use web-based GUI for quick setup, configuration and management</li> <li>Menu-driven interface/Command line interface (CLI ) for local console and telnet access</li> <li>Password protected management and access control list for administration</li> <li>SNMP v1/v2 (RFC1157/1901/1905) agent and MIB II (RFC1213/1493)</li> <li>LRE OAM (IEEE 802.3ah)</li> <li>Software upgrade via web-browser/TFTP</li> </ul>
LEDs	WAN Link/Activity, LAN Link/Act/Speed System: Power, Alarm and Management
Memory	2MB Flash Memory , 4MB SDRAM
Standard	ITU-T G.991.2, IEEE802.3, 802.3u, 802.3ah, 802.3ad
Power	DC 9V via AC power adapter
Power Consumption	9W
Dimensions (D x W x H)mm	168 x 195 x 48mm
Weight	1.3Kg
Temperature	0~50°C (Operating) ,0~70°C (Storage)
Humidity	10~90% non-condensing
Certification	CE, FCC, RoHS
MTBF	35,000 hours

## Ordering Information

- **DCE/2178LRE2-2PK** 4 port LAN extender, 2 wire, 5.7Mbps, 120VAC
- **DCE/2178LRE4-2PK** 4 port LAN extender, 4 wire, 11.4Mbps, 120VAC
- **DCE/2178LRE8-2PK** 4 port LAN extender, 8 wire, 22.8Mbps, 120VAC