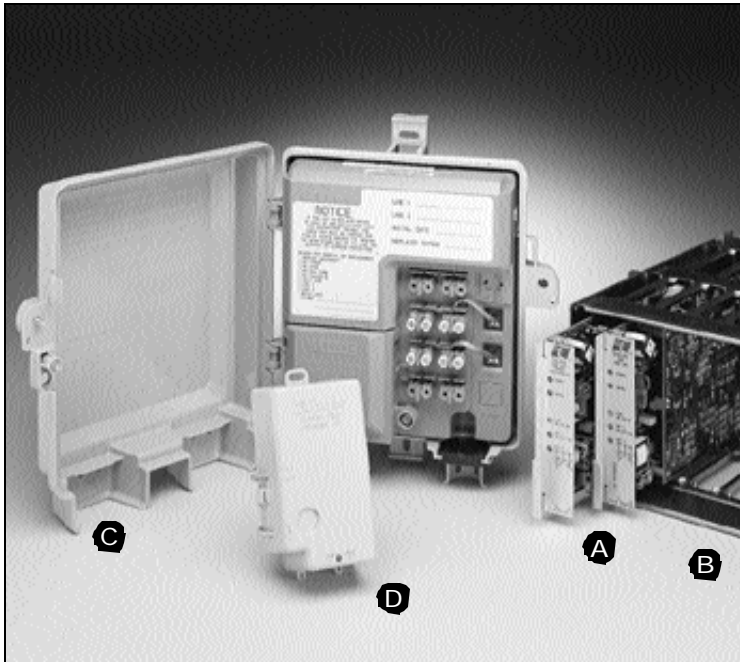


# DuaLine Plus™ (2:1) System

**Add revenue, not copper! The DuaLine Plus™ System doubles copper plant capacity on existing twisted pair.**



The DuaLine Plus™ System multiplexes two 64 Kbps Clear channel POTS lines and transports them over a single twisted pair utilizing noiseless, low power HDSL (2B1Q) line coding. The digital subscriber line (DSL) is then demultiplexed at the Remote Terminal (RT), providing two POTS lines. Ideal for providing customers a second voice or fax line without having to install an additional copper line.

- CLASS<sup>SM</sup> services compatible
- Spectrally compatible with ISDN and other protected services
- NEBS Level 3 certified

## System Components

### **A** Central Office Terminal (COT) Line Card

- Provides 2:1 Digital Pair-Gain (DPG)
- 2B1Q line coding
- Mounts in 300 series shelves
- Enhanced Pre-Provisioning (EPREP) for easy one person turn-up of additional lines
- Compatible with AML/Seiscor/SLC
- 4TEL or MLT line testing signatures
- Rugged design for use at -40° to +65°C (-40° to +149°F)

### **B** 300 Series Shelf

- 23" DML301 shelf; maximum 36 lines (19 slots, 18 COT line units)
- 19" DML305 shelf; maximum of 30 lines (16 slots, 15 COT line units)
- Shelves use 5.25" of vertical rack space (three 1.75" rack spaces)

### **C-D** Remote Terminals (RT)

*Two options available:*

#### **C** RT2

- Drops up to two POTS lines
- Line powered
- Electronics mount in enclosure base
- Enhanced Pre-Provisioning (EPREP) for easy one person turn-up of additional lines
- Rugged design for use at -40° to +65°C (-40° to +149°F)

#### **D** Universal Remote Terminal (URT)

- Drops up to two POTS lines
- Line powered
- Mounts inside a variety of Network Interface Devices (NIDs), from such manufacturers as Siecor® and Antec®
- Enhanced Pre-Provisioning (EPREP) for easy one person turn-up of additional lines
- Rugged design for use at -40° to +65°C (-40° to +149°F)



## System Components (optional)

### D56K COT Line Card

- Multiplexes two 64 Kbps Clear channel POTS lines and transports them over a single twisted pair utilizing noiseless, low power HDSL (2B1Q) line coding
- 56K (V.90) modem performance on both Line 1 and Line 2
- Fully backward compatible with Charles 300 series shelves and DuaLine Plus™ RTs
- 18,000 ft. typical range on single twisted pair (buried, 26 AWG line)
- CLASS<sup>SM</sup> services compatible
- Enhanced Pre-Provisioning (EPREP) for easy one person turn-up of additional lines
- OSMINE Compliant
- Spectrally compatible with ISDN, HDSL, HDSL2 and ADSL
- Patent pending technology



### Alarm Card

- One card per 300 series shelf provides alerts for all cards on shelf
- Visual alarms
- Major alarm LED (red) occurs when all DSLs within the shelf are out of service or there is a power outage
- Minor Alarm LED (yellow) occurs with loss of service on one or more DSLs within the shelf



### CPLE 10-400 PEDLOCK®

- Made entirely of non-corrosive materials
- Full 360° access to cables and apparatus when dome is removed
- Environmentally-sealed and tamper-resistant six-slot card housing



### MX-4000 Mounting Assemblies

- Eight-slot shelf-style card housing
- Wall or rack mount



### 3550 Mounting Assemblies

- Single-slot card housing
- Mount vertically or horizontally on wall or desk

## Also Available: 200 Series

The DuaLine Plus™ System offers 200 series shelves, COT line cards, common unit, COT power unit and a 400 type RT. As with the 300 series, the DuaLine Plus™ System 200 Series COT multiplexes two 64 Kbps Clear channel POTS lines and transports them over a single twisted pair utilizing noiseless, low power HDSL (2B1Q) line coding. The digital subscriber line (DSL) is then demultiplexed at the Remote Terminal (RT), providing two POTS lines.

## System Capabilities

### Transmission Format

2B1Q, 160 Kbps full duplex

### Channelization

Two, 64 Kbps Clear channel POTS lines

### Range of Digital Subscriber Line

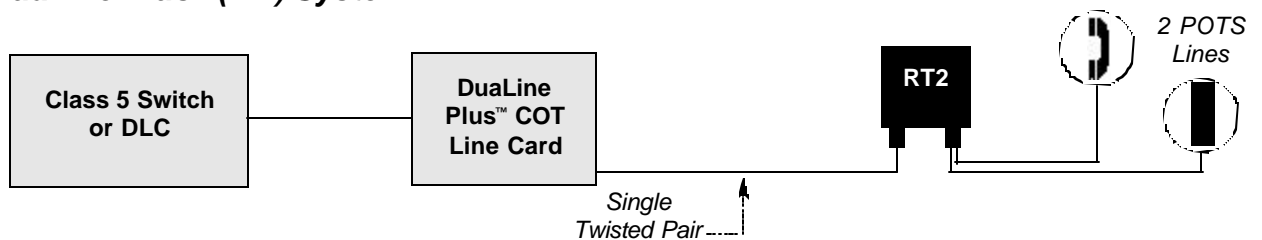
Distance: 22,000 ft. on 24 AWG and 18,000 ft. on 26 AWG

## Electrical Specifications

<b>System loss in each transmission direction</b>	3.5 ± 0.5 dB nominal
<b>Frequency response</b>	The loss relative to 1004 Hz with a 0 dBmO input signal is 0 dB to +3.0 dB at 300 Hz and 3400 Hz, -0.5 dB to +1.0 dB in the 400 to 3000 Hz range and -0.5 dB to +1.5 dB at 3200 Hz
<b>Idle channel noise at the output of the line card</b>	20 dBmO
<b>Channel crosstalk</b>	With 0 dBmO single frequency input signals between 200 and 3400 Hz applied to any line, the C-message weighted total output of either line at the RT in the 200 and 3400 Hz frequency band is -65 dBmO
<b>Range of the digital subscriber line</b>	Line length equal to or less than 1300 ohms or 42 dB loss at 40 KHz with no load coils
<b>Digital subscriber line impedance</b>	135 ohms
<b>Ring detector sensitivity</b>	At 16 2/3 Hz to 66 2/3 (Hz sinewave): 60 Vrms minimum
<b>Office side loop closure resistance</b>	100 ohms typically at 23 mA; 400 maximum at 15 mA
<b>Return loss</b>	(900 ohms +2.16 mF): ERL >18 dB; SRL >10 dB
<b>Power Requirement</b>	0.25 amps maximum at 48 Vdc
<b>DSL voltage</b>	A2 safety voltages for line powering of remote terminal. Idle condition (±80 V tip to ground/ring to ground); busy condition (±140 V tip to ground/ring to ground)

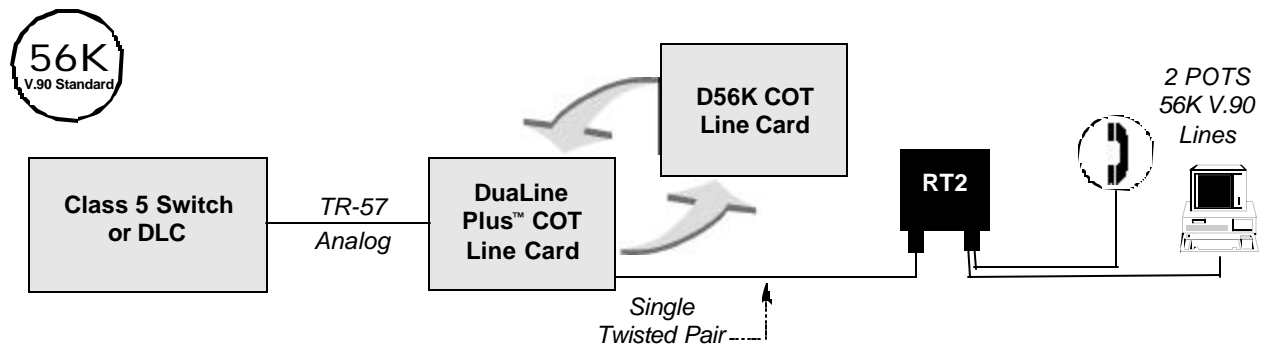
## Configurations

### DuaLine Plus™ (2:1) System



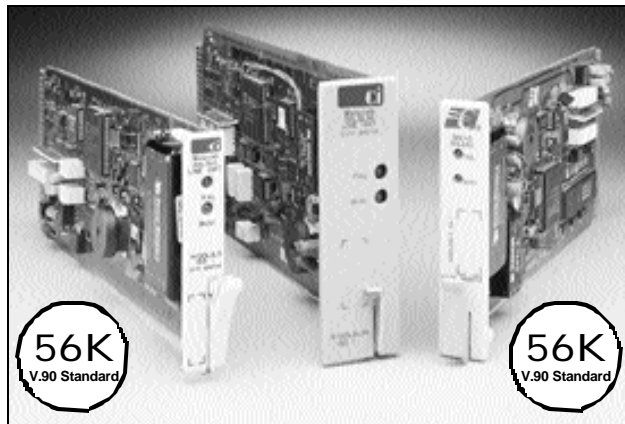
### DuaLine Plus™ (2:1) System with D56K

D56K COT Line Card replaces DuaLine Plus COT Line Card



## DuaLine Plus™ (2:1) Plug-Compatible Channel Units

- Multiplexes two 64 Kbps Clear channel POTS lines and transports them over a single twisted pair utilizing noiseless, low power HDSL (2B1Q) line coding
- NEBS Level 3 certified
- 56K (V.90) modem performance when the line card is in the integrated mode (SL5 SLC® Series 5 or DISC★S® only)
- Compatible with all DuaLine Plus RTs
- 18,000 ft. typical range on single twisted pair
- Enhanced Pre-Provisioning (EPREP) for easy one person turn-up of additional lines
- Temperature hardened for use in harsh environments (-40° to +65°C)
- 4TEL or MLT line testing signatures
- Fail-to-POTS option



SL5 SLC® Series 5  
Channel Unit

SL96 SLC®-96  
Channel Unit

DISC★S®  
Channel Unit

## Ordering Information

<b>Model Number</b>	<b>Product Description</b>
DDL392	COT Line Card - 4TEL Signatures
DDL393	COT Line Card - MLT Signatures
D56K320	COT Line Card - 56K (V.90)
DDL121/122/125/126	Two Line RT Wall Mount
DDL124	Three Line RT Wall Mount
DDL132/135	Two Line RT Pole Mount
DDL2000	Two Line RT Universal Mount
DDL381	Alarm Card
DDL301	High Density 23" 300 Series Shelf
DDL305	High Density 19" 300 Series Shelf
CPL10-400	CPL10-400 Pedlock® Enclosure
DML4008	MX-4000 Mounting Assemblies with Eight-Slot Shelf
3550	Single-Slot Mounting Assemblies
DDL5SLC5	SL5 SLC® Series 5 Plug-Compatible Channel Units - MLT Signatures
DDL5SLC5F	SL5 SLC® Series 5 Plug-Compatible Channel Units - 4TEL Signatures
DDL96SL96	SL96 SLC®-96 Plug-Compatible Channel Units - MLT Signatures
DDL96SL96F	SL96 SLC®-96 Plug-Compatible Channel Units - 4TEL Signatures
DDLDISC	DISC★S® Plug-Compatible Channel Units - MLT Signatures
DDLDISCF	DISC★S® Plug-Compatible Channel Units - 4TEL Signatures

Contact your Charles Sales Representative for specific product part numbers.  
Also available: QuadPOTS (4:1) System and 12:1 Multi-Line System.

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