# MALC Broadband Loop Carrier

MALC 319, MALC 719, MALC 723

## Copper and Fiber Access + Transport Platform Delivering Optimized Voice, Video and Data

✔ *Universal Access for Triple Play*

✔ *IP Video / RF Video Overlay*

✔ *VOIP: SIP / MGCP / H.248*

✔ *TDM/ATM to Packet Migration*

✔ *POTS to Pure Packet*

✔ *ADSL2+ / VDSL2 / EFM*

✔ *PON / Active Ethernet*



The MALC is a full-featured Broadband Loop Carrier (BLC) optimized for delivering voice, data, and video services over a pure packet access network. MALC gives carriers the flexibility to cost-effectively deliver triple play services over existing facilities today and to migrate these services to a pure packet network. This migration is accomplished without disrupting subscriber service or revenue streams, giving carriers the ultimate flexibility for optimizing their networks and serving their subscribers.

Deployed in the Central Office, Remote Terminal, outdoor cabinets or basements, the MALC is offered in a range of compact, hardened chassis supporting densities from 24 to 960 ports per shelf with integrated packet ring transport. With line cards, cabling, provisioning and management common to all chassis, the MALC minimizes training, stocking, and operating expenses.
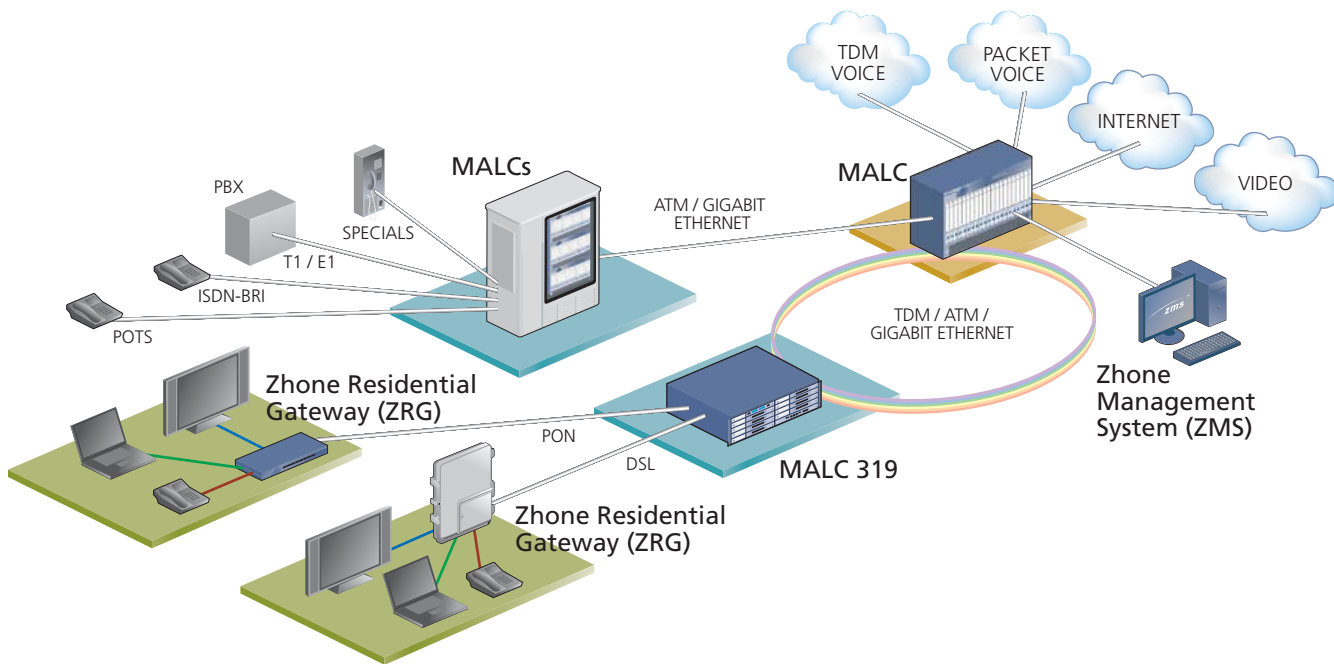
The MALC enables service providers to deploy a wide variety of business and residential services in a single platform. These services are deployed over the MALC large list of access technologies which include fiber (both PON and Active Ethernet), ADSL2+, ReachDSL, SHDSL, POTS, ISDN and T1/E1.

### Enabling Residential & Business Services

The MALC product line enables service providers the ability to offer high-end residential and business services on the same platform. HSIA, VOIP, POTS, IPTV, Business broadband, Ethernet and High Cap services can be offered over copper and/or fiber.

### Flexibility

Service providers can use MALC's flexible architecture to deploy different technologies such as POTS, xDSL, xPON, EFM and Active Ethernet on the same platform in their Central offices or Remote Terminals as a fiber to the home (FTTP) or Fiber to the node (FTTH) network element. The MALC product line also includes multiple form factors, 1U, 3U and the high density 7U providing a solution for all deployment sizes.

## Redundancy

The MALC chassis with its fault tolerant control software and redundant uplink hardware design increases the resiliency and the scalability of the product. It also offers Resilient Packet Ring (RPR) over Gigabit Ethernet to increase the reliability of the network.

## Migration from TDM/ATM to IP

Software-selectable line and trunk interfaces provide elegant circuit-to-packet migration. A range of uplinks - including T1/E1 ATM (UNI and IMA), T1/E1 TDM (GR.303 and V5.2), SONET and Gigabit Ethernet - allow carriers to maintain existing TDM services while simultaneously retooling for VoIP services using SIP, MGCP or H.248 signaling. Moreover, Zhone's integrated ADSL + POTS technology eliminates cutovers and truck rolls by allowing carriers to provision broadband or narrowband services remotely.

## Management

The MALC product line integrates into Zhone's Management system (ZMS) giving the service provider total control over their entire network. Using ZMS multiple MALC nodes can be managed from

remote locations, customer provisioning, fault isolation, Auto discovery, alarm aggregation and maintenance can easily preformed without any service interruption.

## Cost Savings/Operating Costs

Zhone's MALC provides the functions of a Broadband Loop Carrier (BLC), FTTN, DSLAM, PON OLT, VoIP Line Access Gateway and a GR-303/V5.2-compliant voice gateway. The MALC allows access network operators to deliver Triple Play services concurrently over copper or fiber access lines. This flexibility provides Operators with reduced sparing, training, management and installation expenses, hence reducing overall operating cost

## Cabinets

The Zhone access portfolio is completed with a full line of outside plant cabinets completely engineered to support Zhone's MALC product line. Zhone's cabinet line has configurations that are designed to support small density to large scale deployments, with a full range of options designed to meet Service Providers needs.

# MALC Broadband Loop Carrier

## Technical Specifications

### Dimensions

- MALC 319
  - 3U: 5.22 x 17.40 x 11.3 inches / 13.26 x 44.20 x 28.70 cm
  - Slots: 10; front card access
- MALC 719
  - 7U: 12.22 x 17.25 x 11.15 inches / 31.04 x 43.81 x 28.32 cm
  - Slots: 17; front card access
- MALC 723
  - 7U: 12.22 x 21.18 x 11.15 inches / 31.04 x 53.64 x 28.32 cm
  - Slots: 21; front card access

### Power

- DC: -43.75V to -62V
- Dual (A / B redundant) power feeds

### Interfaces

- POTS
- POTS Specials
- ADSL (DMT / G.Lite) Annex A, B, C, M, S=1/2, 2+
- Combo ADSL2+ w/ Integrated POTS
- ADSL2+ w/ Integrated Splitters
- ReachDSL
- SHDSL (2w or 4w)
- SHDSL EFM 802.3ah with Bonding
- VDSL2 G.993.2
- T1 / E1 ATM IMA
- T1 / E1 (CES) (structured, unstructured)
- T1 / E1 EFM Including Bonding
- BPON OLT G.983.1 / G.983.3 compliant
- GPON OLT G.984.1-4 compliant

### Voice Support

- VoIP: MGCP (RFC 3435), SIP (RFC 3261), H.248
- VoATM: ATMF AAL2 LES
- G.711 encoding with G.168 echo cancellation
- G.726
- G.729 with fallback to G.711 for fax
- 2 Interface Groups per card
- GR-303 / V5.2
- Full GR-303 EOC and TMC implementation
- Integrated Specials: Ground Start, Dial Pulse, Metering, PLAR

### Protocol Support

- RIP v1 (RFC 1058)/RIP v2 (RFC 2453)
- DHCP Server (RFC 2131, 2132)
- DHCP Relay
- Bridging 802.1D
- VLAN 802.1Q with 802.1p Priorities
- Multicast IGMP v1/v2
- IEEE 802.17 RPR

### Management

- Terminals
  - ZMS (Zhone Management System) via SNMP v2c for GUI and CORBA IDL machine interface
  - Terminal for Command Line Interface (CLI)
  - Built-in GUI-based Management
- Management Interfaces
  - In-band IP over AAL5
  - Out-band IP over 10 / 100 Base-T Ethernet or V.24 serial for async terminal
  - Up to 12 external alarm closures

### Regulatory Compliance

- NEBS level 3 compliant
- RUS listed
- Safety: UL 60950 3rd edition, CSA 950 3rd edition, EN 60950, AS / NZS 3260, TS 001
- Emissions: EN 55022A, CFR47 PART 15A (FCC)
- Immunity: NEBS GR-1089-Core level 3, EN 55024, EN 55082-1, T1.601-1992
- Environmental: NEBS GR-63-Core level 3, GR-487 compliant, ETS 300 019-2-x compliant, ISTA transportation and handling
- Network Certification: FCC Part 68, CTR-12, CTR-13, DOC CS-03, TSO 16, GR-57
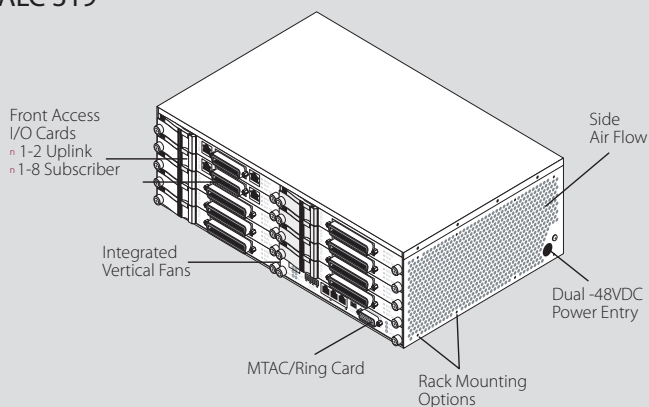- Telcordia OSMINE certification

### Operating Requirements

- Ambient operating temperature: -40° C to +65° C
- Relative operating humidity: up to 85% (non-condensing)
- GR-487 compliant
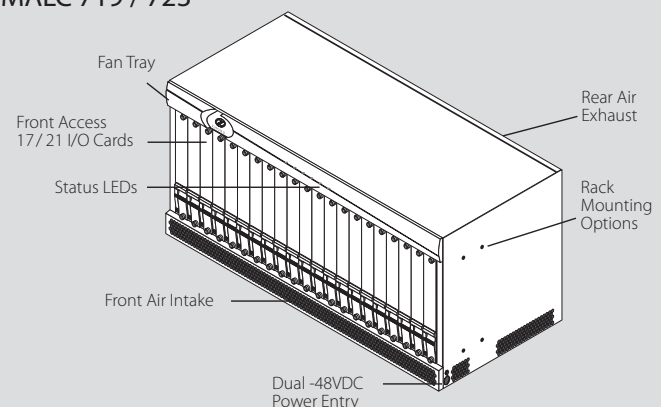- Designed for outside plant deployment

### Uplinks & Line Cards

- Uplinks:
  - Gigabit Ethernet/RPR w/ Optional TDM
  - OC3c/STM1
  - DS3/E3
  - 8 Port T1/E1 ATM
  - 16 Port T1/E1 ATM/TDM
- Optical Based Line Cards:
  - GPON OLT
  - Active Ethernet
- Copper based Line Cards:
  - ADSL2+/POTS Combo
  - POTS
  - P-Phone
  - Metallic Test Access/Ringer
  - Integrated Metallic Test Access
  - Voice Gateway
  - ADSL2+
  - VDSL2
  - ReachDSL
  - SHDSL Cell-based
  - SHDSL EFM
  - T1/E1 EFM/PKT
  - T1/E1 ATM/IMA
  - T1/E1 Circuit Emulation over IP/ATM

## MALC 319



Front Access I/O Cards
- 1-2 Uplink
- 1-8 Subscriber

Integrated Vertical Fans

MTAC/Ring Card

Rack Mounting Options

Side Air Flow

Dual -48VDC Power Entry

## MALC 719 / 723



Fan Tray

Front Access 17 / 21 I/O Cards

Status LEDs

Front Air Intake

Dual -48VDC Power Entry

Rear Air Exhaust

Rack Mounting Options

# MALC Broadband Loop Carrier

## Ordering Information

### MALC Chassis

| | |
|---|---|
| MALC-CHASSIS-319 | 3U, 19 Inch, 10 Slot Chassis |
| MALC-CHASSIS-19 | 7U, 19 Inch, 17 Slot Chassis |
| MALC-CHASSIS-23 | 7U, 23 Inch, 21 Slot Chassis |

### MALC Uplinks

| | |
|---|---|
| MALC-UPLINK-2-FE/GE | 2 port GigE Uplink Card |
| MALC-UPLINK-2-FE/GE-TDM | 2 Port GigE Uplink with 8 Port T1/E1 TDM Uplink Ports |
| MALC-UPLINK-DS3/E3-ATM/IP | 4 Port DS3/E3 Uplink Card |
| MALC-UPLINK-OC3C/STM1-ATM/IP | 2 Port OC3C/STM1 Uplik Card |
| MALC-UP-T1/E1-ATM/TDM/IP-16 | 16 Port T1/E1 Uplink Supporting ATM/TDM/IP |
| MALC-UPLINK-T1/E1-ATM/IP-8 | 8 Port ATM/IP IMA Uplink Card |

### Residential DSL and Voice Access Line Cards

| | |
|---|---|
| MALC-POTS-TDM-48 | 48 Port TDM based POTS Line Card |
| MALC-POTS-TDM/PKT-48 | 48 Port TDM and Packet POTS Line Card |
| MALC-POTS-GBL-TDM/PKT-24 | 24 Port TDM and Packet Line Card with Specials |
| MALC-EBS-TDM/PKT-24 | 24 Port P-Phone Line Card |
| MALC-ADSL+POTS-TDM-48A/M-2S | 48 Port TDM Combo ADSL/POTS Line Card |
| MALC-ADSL+POTS-PKT-48A/M-2S | 48 Port TDM and Packet Combo ADSL/POTS Line Card |
| MALC-VG-T1/E1-8-2S | 8 Port Voice Gateway Line Card (2 Slot) |
| MALC-VG-T1/E1-32-2S | 32 Port Voice Gateway Line Card (2 Slot) |
| MALC-ADSL-48A/M | 48 Port ADSL2+ Line Card with Annex A, M support |
| MALC-ADSL+SPLTR-48A/M-2S | 48 Port ADSL2+ Line Card with Integrated Splitters |
| MALC-ADSL-BCM-48A | 48 Port ADSL2+ Line Card with Bonding Support, Annex A |
| MALC-ADSL-BCM-48B | 48 Port ADSL2+ Line Card with Bonding Support, Annex B |
| MALC-ADSL+SPLTR-BCM-48A-2S | 48 Port ADSL2+ Line Card, Integrated Splitters, Bonding Support, Annex A |
| MALC-ADSL+POTS-BCM-PKT-48A-2S | 48 Port TDM and Packet Combo ADSL+POTS Line Card, Annex A |
| MALC-ADSL+POTS-BCM-PKT-48B-2S | 48 Port TDM and Packet Combo ADSL+POTS Line Card, Annex B |
| MALC-VDSL2-17A-24 | 24 Port VDSL2 Line Card |
| MALC-REACHDSL-24 | 24 Port ReachDSL Line Card |
| MALC-REACHDSL+SPLTR-24 | 24 Port ReachDSL Line Card with Integrated Splitters |

# MALC Broadband Loop Carrier

## Ordering Information

### Business Access Line Cards

| | |
|---|---|
| MALC-ISDN-2B1Q-24 | 24 Port ISDN Line Card (Supports 2B1Q) |
| MALC-ISDN-4B3T-24 | 24 Port ISDN Line Card (Supports 4B3T) |
| MALC-GPON-SC-1 | 1 Port GPON OLT supporting 64 Subscribers |
| MALC-ACTIVE-ETH-FE/GE-10 | 10 Port Active Ethernet Line Card |
| MALC-EFM-T1/E1-24 | 24 Port T1/E1 EFM Line Card with Port Bonding |
| MALC-EFM-SHDSL-24-NTP | 24 Port SHDSL EFM Line Card with Port Bonding and line power |
| MALC-EFM-SHDSL-24-NTWC | 24 Port SHDSL EFM Line Card with Port Bonding and wetting current |
| MALC-SHDSL-48 | 48 Port SHDSL Line Card |
| MALC-T1/E1-ATM-32 | 32 Port T1/E1 ATM/IMA Line Card |
| DS3/E3 Subtending | 4 port DS3/E3 Line Card |

### Metallic Test Access Line Cards

| | |
|---|---|
| MALC-MTAC/RING | Metallic Test Access Card with POTS Ringers (719/723 Chassis Only) |
| MALC-MTAC/RING-ENH | Metallic Test Access Card with POTS Ringer supports Integrated Line Testing (719/723 Chassis Only) |
| MALC-MTAC/RING-FC | Metallic Test Access Card with POTS Ringer and Fan Controller (319 Chassis Only) |

For more information about Zhone and its products, please visit the Zhone Web site at www.zhone.com or e-mail info@zhone.com

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