

## FlexStream AK355 / AK355E DS3 and Ethernet Over Copper



AK355 - AK355E

The AK355E enables point-to-point Ethernet over Copper services and is ideally suited for demanding applications such as DSLAM Backhaul over long distances. The AK355 offers point-to-point transport of DS3 or Ethernet over Copper (EoC), providing a smooth migration from TDM to IP. Both solutions bond together 2 to 16 copper pairs creating a symmetric or asymmetric high bandwidth link capable of delivering up to 100 Mbps out to 12 Kft/3.7 Km\* or 45 Mbps out to 17 Kft/5.2 Km\*.

### Industry's only Asymmetric Bandwidth Feature

Positron's signature FlexStream functionality enables the AK355 and AK355E to run either in symmetric or asymmetric mode with a simple software command. It allows service providers to dictate how much bandwidth is allocated to downstream vs. upstream traffic - an essential tool for ensuring precious bandwidth is used as efficiently as possible.

### DS3 or Ethernet

The AK355 can be configured as either a 100 Mbps Ethernet or a 45 Mbps DS3 product. This powerful combination of capabilities makes the AK355 the perfect product to support service provider network migration strategies. The AK355E supports Ethernet functionality and can be configured to deliver up to 100 Mbps. The AK355 and AK355E systems consist of 1RU high Central Office and Remote units for 19" and 23" racks or for wall mounting. They are environmentally hardened and the Remote units can be either line or locally powered.

### AK355 and AK355E are T1.417 Compliant

Unlike other bonded copper-based broadband systems, the AK355 and AK355E deliver services that can co-exist in the same binder groups with ADSL and HDSL. This advantage exists because both systems are T1.417 spectrally compliant at bit rates and reaches that G.SHDSL based products cannot meet without the need for expensive and cumbersome repeater devices. The AK355 meets all DS3 standards. When the systems are in Ethernet mode, they are compliant with IEEE 802.3ah EFM, IEEE 802.1 and 802.3 LAN standards. They also comply with Metro Ethernet Forum MEF9/MEF14.

The first broadband over copper products to utilize patented MIMO on DMT technology, the AK355 and AK355E achieve up to 10 times more bandwidth when compared to existing symmetric DSL technologies. Utilizing Positron's breakthrough multi-channel signal processing techniques embodied in the hardware and software, the AK355 and AK355E can transport more bandwidth over longer distances on fewer pairs than any other technology. This significant improvement is achieved by overcoming traditional copper transmission interferences such as self cross-talk, alien cross-talk and noise. The superior performance lets providers deliver more bandwidth and reach up to three times more customers.

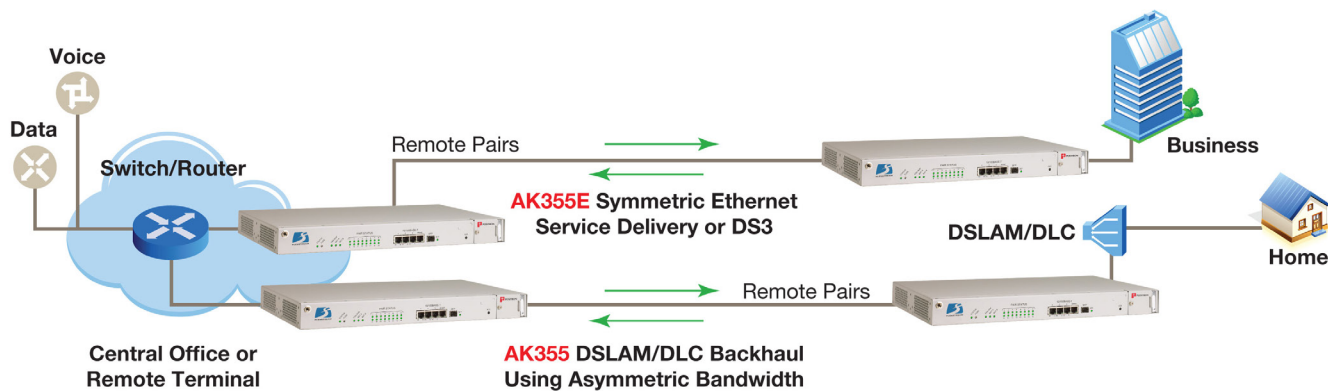
The AK355 and AK355E dynamically compensate for individual copper pair failures. If a copper pair fails, the systems automatically adjust the other copper pair margins to compensate for the loss. This allows any pair to protect all pairs in a bonded group.

The systems can be managed by Positron's Element Management Software (AKEMS) and AktinoView (GUI software) or via a Command Line Interface (CLI). The systems interoperate with standard Network Management Systems to provide comprehensive performance monitoring for both the transport physical layer and Ethernet or DS3\*\*.

\* 24 AWG copper pair

\*\* AK355 system only





## TECHNICAL SPECIFICATIONS

### System

- Bandwidth over 16 Pairs:
  - DS3<sup>\*\*</sup>: 45 Mbps Asymmetric or Symmetric at CSA Reaches with Full Disturbers
  - Ethernet: 100 Mbps Symmetric at 4 Kft, 100 Mbps Asymmetric, 55 Mbps Symmetric at CSA Reaches with Full Disturbers
- System Latency: 2 ms
- Resiliency: Carrier grade automatic pair failure protection
- BER: 10<sup>-12</sup>

### Standard Interfaces: DS3<sup>\*\*</sup>

- Number of BNC Ports: 2 per Card
- Line Code/Rate: B3ZS/44.736 Mbps ± 20 ppm
- Framing: C-bit Parity or M13
- Payload Mode: Clear Channel, TDM, ATM, Scrambled ATM

### Standard Interfaces: Ethernet

- Interfaces: Three 10/100 BaseT RJ45 and one 100 BaseFX or 1000 BaseX SFP port
- Compliance: IEEE 802.3

### Outside Plant Pairs

- Technology: MIMO on DMT
- Number of Pairs: 2 to 16
- Connector: 50-pin Telco
- Compliance: T1.417 (Spectral)
- IEEE 802.3ah EFM

### Management Interfaces

- 10/100 BaseT RJ45

### Front Panel Indicators

- Status, Fuse, Fan Alarm, Battery A/B Alarm, SFP status, Ethernet Link and Activity
- Outside Plant Pair Status (16)

### Layer 2 Features

- VLAN Tagging: IEEE 802.1q Support
- Stacked VLAN Tagging IEEE 802.1ad (IEEE 802.1QinQ)
- Support up to 2036 byte Maximum Transmission Unit (MTUs)

- Priorities: IEEE 802.1p, Port or IP DSCP
- Dynamic Bridging: 8K MAC Addresses
- Metro Ethernet Forum Certified (MEF9, MEF14)

### Electrical Specifications

- AK355CP and AK355CP E units
  - Power Input: -42 to -56.7 Vdc
  - Max Heat Dissipation: 65 Watts
- AK355R and AK355R E units
  - Line Powered by CO Unit or
  - Local Power Input: -42 to -56.7 Vdc
  - Max Heat Dissipation: 60 Watts
  - Provides 48 Vdc, 15 Watt output

### Environmental Specifications

- Operating Temperature: -40 to +65°C
- Storage Temperature: -40 to +70°C
- Relative Humidity: Up to 95%, non-condensing

### Mechanical Specifications

- Chassis Dimensions: 1.75" (4.5cm) High (1RU) x 17.2" (43.7cm) Wide x 10.5" (26.7cm) Deep
- Weight: Approximately 10 lbs (4.5 kg)

### Alarm Contacts

- Critical, Major, Minor, SysID
- Alarm Cut-Off Pushbutton
- Auxiliary alarm inputs (2)

### Network Management

- Command Line Interface (CLI), SNMP
- Positron Element Management System (AKEMS) or AktinoView EMS, GUI and Web
- DS3 ATM Inband Management<sup>\*\*</sup>
- Ethernet VLAN Inband Management

### Regulatory Approval

- NEBS
- UL60950
- FCC Part 15 Class A

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\*\* AK355 system only



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