

## About Actelis Networks

### Who We Are

Actelis Networks is the industry leading provider of high performance and scalable broadband over copper solutions. Actelis turns copper into a strategic asset that enables delivering reliable, high-speed Ethernet services and broadband access to metro and campus environments more quickly, easily, and cost effectively than can be done by using fiber optics or microwave.

Founded in 1997 and based in Fremont, California, Actelis has global operations including R&D facilities in Tel Aviv, regional sales offices worldwide, and an extensive network of value added resellers and distributors. Actelis has a global market presence including telecom mobile and fixed network operators such as PTTs/RBOCs, ILECs/IOCs, and CLECs, plus operators of government, industrial, utility, and railway networks.

Actelis specializes in providing G.SHDSL and VDSL2 based Ethernet First Mile (EFM) “bonded copper” products and solutions, and Broadband Amplifiers (BBA) for VDSL2 and ADSLx.

The Actelis Ethernet First Mile (EFM) bonded copper solutions leverage a unique and innovative suite of transmission technologies, *EFMplus™*, which optimizes transport of up to 100s of Mbps of reliable, high performance, standards-based Ethernet to small and medium businesses located off the fiber footprint, and to provide backhaul for WiFi hotspots, 3G/4G small cells or remote DSLAMs. Actelis EFM solutions are also used for providing Ethernet services and broadband access in municipal networks and schools, and for backhauling traffic from sensors and HD surveillance cameras used in intelligent traffic systems, public safety, utility, and industrial applications.

Actelis’ innovative Broadband Amplifiers (BBAs) significantly enhance the bandwidth and distance capabilities of ADSLx and VDSL2 services for residential broadband builds, expanding the customer service area and leveraging existing DSLAMs from any vendor and offering up to 200% more bandwidth and 50% greater distance than DSL alone. This gives service providers a more efficient way to enhance residential broadband services to cost effectively reach more customers with more service to generate greater revenue and profitability.

## Our Mission

Actelis Networks enables network operators to take reliable high performance broadband bandwidth to more places more quickly, simply and cost effectively than can be done by using fiber optics or microwave. Leveraging best in class transmission expertise, Actelis makes copper a strategic asset that complements the installed base of fiber and DSL, enabling operators to efficiently reach more customers, offer greater bandwidth and new services, and accelerate time to market while maximizing revenue and profitability.



## Our Vision

Growth in bandwidth demand today is being fueled by new customers, new applications, and increasing mobility. Everyone is using mobile data now, both on mobile and WiFi networks. Residential customers have begun consuming multiple streams of HD video. And small and medium businesses are rapidly becoming consumers of both high speed IP/Ethernet and Cloud services. Intelligent traffic system, industrial, environmental and security sensors and HD surveillance cameras are being deployed almost everywhere throughout the metro. But the fiber network is not designed to do this cost effectively, and wireless technologies can meet only a fraction of the need while involving greater operational complexity. So all the increased network utilization and revenue growth opportunity can only be realized profitably if service operators find a way to get more bandwidth to more places more cost effectively than ever before.

Fiber networks are best for delivering high bandwidth to concentrated users, but are not optimal for aggregating moderate amounts of bandwidth from many locations FTTH is extremely expensive, and FTTC still involves the expense of pushing many smaller and less efficient DSLAMs closer to customers and having to backhaul traffic from many locations. Likewise, wireless microwave while great for long distances with line of sight, is not optimized for getting bandwidth to many buildings or locations in a metro that are down at street level. Another solution is required.

Copper, a widely available and fully amortized asset, offers the quickest and most cost effective way to provide connectivity to many places throughout the metro, but historically it was limited to n x T1/E1 bandwidth scalability and native DSL transmission rates, and was subject to some performance variability due to EMI, crosstalk, and transients.

Actelis Networks has developed best in class Ethernet First Mile (EFM) over Copper transmission technology and standards-based innovation to overcome EMI, crosstalk, and transients to make copper a highly reliable, high performance transmission media. Actelis scales Ethernet services into the 100s of Mbps and beyond for use in

mission critical applications. Actelis' high performance broadband over copper more quickly and cost effectively reaches the many buildings occupied by small and medium businesses, and the WiFi hotspots, small cell base stations, HD cameras and sensors where copper meets and exceeds bandwidth and performance requirements and where the cost and complexity of fiber or microwave are simply not justified. Only by using Actelis' Broadband over Copper wherever possible can service operators maximize profitability for these high growth applications.

Expanding from G.SHDSL to VDSL2 EFM over Copper solutions, Actelis continues to push the envelope on offering higher real world performance per pair, and was the first EFM over Copper vendor to support the full suite of MEF CE2.0 services including E-Access to enable operators to offer a full suite of standards-based Ethernet services for wholesale as well as retail. Actelis plans integration of G.SHDSL and VDSL2 aggregation to enable efficient deployment of each technology where they best fit the requirement, and continues to scale performance monitoring capabilities to manage today's high speed traffic flows.

Actelis continues to expand the portfolio with innovative approach to Broadband Amplifiers (BBAs) that simplify enhancing DSL performance, while being compatible with and additive to the benefits of vectoring - improving the economics of leveraging VDSL2 and ADSL for offering more bandwidth.

Actelis sees G.fast as the next step in copper evolution, and is working toward adding G.fast capabilities that will complement VDSL2 and be particularly useful for broadband access in selected very high density areas in the metro and particularly for high-speed in-building copper wiring. And we continue to look beyond initial G.fast standards to make even higher-speed access over copper a reality in the future, which will change the ratio of the various broadband over copper technologies used in networks.

Last but not least, Actelis will play in NFV and SDN scenarios, relying on strategic partners for higher layer technologies, integrating our platforms with them and continuing to provide the Layer 1 and 2 broadband over copper solutions that will be essential to making cost effective broadband over copper access necessary to optimize time to market and cost for next-gen broadband builds.

## Our Value

Actelis Networks' superior *EFMPlus*<sup>™</sup> suite of transmission technology enables getting more reliable, high performance broadband bandwidth anywhere to serve business, residential, mobile, transportation, utility and education networks over copper more quickly, easily, and cost effectively than can be done by fiber or microwave.

The flexible Actelis portfolio contains both G.SHDSL and VDSL2 based EFM over Copper ("bonded copper") and Broadband Amplifier solutions, and Actelis will continue to be a leader in high performance broadband over copper embracing future G.fast offerings and playing as a key enabling access technology fully integrated within NFV and SDN ecosystems.

### *Generate New Service Revenues with Reliable, High Performance Services*

Actelis enables service operators to deliver more value to business and residential customers throughout the metro, selling them reliable, high performance bandwidth, maximizing quality of experience, meeting critical KPIs and SLAs, and achieving a faster time to market with a lower CapEx investment. And all while using fewer pairs than competitors to deliver more bandwidth over greater distances.

In residential markets, Actelis enables reaching many more customers with higher speed access and triple play services. In the business markets, Actelis enables the introduction of competitive new retail and wholesale Ethernet access and Cloud services that are standards-based, MEF-certified, and feature best in class transmission technology. The Actelis suite of Layer 2 features enable creating service differentiation as well as ensuring efficient operations, administration, and maintenance (OAM).

### *Grow Market Share by Reaching More Locations & Customers*

The ability to reach more customers with more reliable, high performance bandwidth more quickly and efficiently than competing access technologies and other broadband over copper vendors.

Those residential operators that use Actelis to make copper a strategic asset gain time to market advantages in offering higher speed broadband access and triple play services in residential markets. Operators that leverage Actelis to upgrade small cell backhaul more quickly than rivals gain the ability to offer better coverage, greater mobile data bandwidth, and price more competitively in order to reduce churn and enjoy a net gain in subscribers. Providers of Business Ethernet services can reach small and medium business customers with competitive standards-based, dedicated Carrier Ethernet retail and wholesale services that support SLAs to combat competition from cable operators.

### *Improve Your ROI by Leveraging Existing Assets and Minimizing CapEx and OpEx*

Actelis Networks uses copper to complement the installed base of fiber and DSL infrastructure, extending service more cost effectively off the fiber ring for business and network applications in the metro, and allowing DSL networks to be upgraded to reach more customers with more bandwidth for residential markets.

Copper is a widely available, fully amortized, and inexpensive infrastructure, whether the operator has their own plant or leases pairs. Use of copper significantly reduces the CapEx investment required to offer new Ethernet and higher speed VDSL2 or ADSLx broadband services, which enhances profitability and ROI.

