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Description	 <ul style="list-style-type: none"> Ethernet Access Device for symmetrical, high-speed Ethernet over bonded copper Optimized for CPE applications 	 <ul style="list-style-type: none"> Ethernet Access Device for symmetrical, high-speed Ethernet over bonded-copper or fiber 	 <ul style="list-style-type: none"> Advanced Ethernet Access Device for symmetrical, high-speed Ethernet over bonded-copper or fiber 	 <ul style="list-style-type: none"> Integrated TDM & Ethernet Access Device for seamless migration from all-TDM to combined TDM and Ethernet Backhaul/Service Hybrid TDM/Copper/Fiber 	 <ul style="list-style-type: none"> Advanced Ethernet Access Device for asymmetrical, high-speed Ethernet over bonded-copper or fiber 	 <ul style="list-style-type: none"> Ethernet Access Device for symmetrical, high-speed Ethernet over fiber
Applications	Ethernet Services: <ul style="list-style-type: none"> T1/E1 Line Replacement Transparent LAN Service Fast Ethernet Access Metro Ethernet Extension Private Campus Networks Intelligent Transportation Systems	Backhaul: <ul style="list-style-type: none"> DSLAM MTU/MDU Ethernet Services: <ul style="list-style-type: none"> T1/E1 Line Replacement Transparent LAN Service Fast Ethernet Access Metro Ethernet Extension Private Campus Networks Intelligent Transportation Systems	Backhaul: <ul style="list-style-type: none"> DSLAM MTU/MDU Ethernet Services: <ul style="list-style-type: none"> CE 2.0 services T1/E1 Line Replacement Transparent LAN Service Fast Ethernet Access Metro Ethernet Extension Private Campus Networks Intelligent Transportation Systems	Backhaul: <ul style="list-style-type: none"> Mobile/Cell Site DSLAM & PBX MTU/MDU Ethernet Services: <ul style="list-style-type: none"> Transparent LAN Service Fast Ethernet Access Metro Ethernet Extension Private Campus Networks Intelligent Transportation Systems	Backhaul: <ul style="list-style-type: none"> DSLAM MTU/MDU Ethernet Services: <ul style="list-style-type: none"> T1/E1 Line Replacement Transparent LAN Service Fast Ethernet Access Metro Ethernet Extension Private Campus Networks Intelligent Transportation Systems	Backhaul: <ul style="list-style-type: none"> Mobile/Cell Site DSLAM MTU/MDU Ethernet Services: <ul style="list-style-type: none"> T1/E1 Line Replacement Transparent LAN Service Fast Ethernet Access Metro Ethernet Extension Private Campus Networks Intelligent Transportation Systems
Network Service I/F	<ul style="list-style-type: none"> 4x10/100 Base-T 	<ul style="list-style-type: none"> 4x10/100 Base-T 1x100/1000 Base-FX (ML638) 1x100 Base-FX (ML628, ML624) 	<ul style="list-style-type: none"> 4x10/100/1000 Base-T (ML640E) 4x10/100 Base-T (ML640) 2x100/1000 Base-FX 	<ul style="list-style-type: none"> 4xE1/T1/CLK 4x10/100 Base-T/CLK 2x100/1000 Base-FX/CLK 	<ul style="list-style-type: none"> 4x10/100 Base-T 2x100/1000 Base-FX 	<ul style="list-style-type: none"> 4x10/100 Base-T 2x100/1000 Base-FX (ML530 only)
Copper I/Fs	<ul style="list-style-type: none"> 4, 2 or 1 copper pairs; 2Base-TL (IEEE 802.3ah /ITU-T G.998.2 over Extended G.SHDSL) 	<ul style="list-style-type: none"> 8 copper pairs; 2Base-TL (IEEE 802.3ah /ITU-T G.998.2 over Extended G.SHDSL) 	<ul style="list-style-type: none"> 16, 8 or 4 copper pairs 2Base-TL (IEEE 802.3ah /ITU-T G.998.2 over Extended G.SHDSL) 	<ul style="list-style-type: none"> 8 or 4 copper pairs; 2Base-TL (IEEE 802.3ah /ITU-T G.998.2 over Extended G.SHDSL) 	<ul style="list-style-type: none"> 8, 4 or 2 copper pairs; 10BaseTS (IEEE 802.3ah /ITU-T G.998.2 over DSL/DMT) 	<ul style="list-style-type: none"> None
Topologies	<ul style="list-style-type: none"> Point-to-point (CO/RT) Point-to-multipoint (RT/CPE) 	<ul style="list-style-type: none"> Point-to-point (CO/RT) Point-to-multipoint (RT/CPE) 	<ul style="list-style-type: none"> Point-to-point (CO/RT) Point-to-multipoint (RT/CPE) Fiber Ring 	<ul style="list-style-type: none"> Point-to-point (CO/RT) Point-to-multipoint (RT/CPE) Fiber Ring 	<ul style="list-style-type: none"> Point-to-point (CO/RT) Point-to-multipoint (RT/CPE) with 3rd party DSLAM Fiber Ring 	<ul style="list-style-type: none"> Point-to-point (CO/RT) Point-to-multipoint (RT/CPE) Fiber Ring (ML530 only)
Main Features	<ul style="list-style-type: none"> IEEE 802.3ah Actelis EFMplus, DRB, DRB friendly and DSS Up to 1Gbps over Fiber ML600 /ML640E - Up to 15 Mbps/pair, Up to 100 Mbps over 8 pairs ML6416/E - Up to 15 Mbps/pair, Up to 230 Mbps over 16 pairs ML700 - Up to 750 Mbps Wire speed switching L2 & L3 Classification MEF 10 compliant, flexible service configuration capabilities Advanced O&M capabilities, including Y.1731, 802.1ag and 802.3ah ; Integrated test generator/analyzer with ML640E/ML640/ML6416/ML650S 					
Regulatory Compliance/Certifications	<ul style="list-style-type: none"> CE 1.0 - MEF 9, 14 (ML600 Series Certified; ML700 Compliant); MEF 18 (ML650 Certified) CE 2.0 - ML640E: ML644E, ML648E - Certified, ML6416E- in process , ML640 Certified (ML644, ML648, ML6416), ML650 (ML658s, ML654s) Compliant IEEE 802.3ah, ITU-T G.998.2 ITU-T G.991.2, ETSI TS 101 524 					
Spectral Compliance	<ul style="list-style-type: none"> ITU-T G.991.2 (Annex A, B, F, G) ETSI TS 101 524 (Annex E) 					



	ML2300	ML230	ML690	XR239 Repeater	Broadband Amplifier (BBA)
Description	 <ul style="list-style-type: none"> Ethernet Aggregation Switch for symmetrical, high-speed Ethernet over bonded copper or fiber 	 <ul style="list-style-type: none"> Ethernet Aggregation Switch for symmetrical, high-speed Ethernet over bonded copper or fiber 	 <ul style="list-style-type: none"> Ethernet Access Device for symmetrical, high-speed Ethernet over bonded copper or fiber 	 <ul style="list-style-type: none"> Industry's first EFM Repeater Extend reach of high-bandwidth Ethernet services, covering 98% of all loops 	 <ul style="list-style-type: none"> Standards-based device installed at existing splice points of copper loops to deliver higher bandwidth DSL services much further from the CO or DSLAM <ul style="list-style-type: none"> ADSL Broadband Amplifier (ABA) <ul style="list-style-type: none"> Supports ADSL2+/ADSL2/ADSL VDSL2 Broadband Amplifier (VBA) <ul style="list-style-type: none"> Optimized for VDSL2
Applications	<ul style="list-style-type: none"> Carrier-class, high availability applications Optimized for high-density, medium-to-large COs Intelligent Transportation Systems Backhaul 	<ul style="list-style-type: none"> Carrier-class, high availability applications Compact and optimized for high-density, medium-to-large COs or RTs Intelligent Transportation Systems Backhaul 	<ul style="list-style-type: none"> Carrier-class, high availability applications Compact and optimized for small COs or RTs Intelligent Transportation Systems Backhaul 	<ul style="list-style-type: none"> Extending the reach and coverage of Ethernet over bonded-copper services for backhauling applications, and business services 	Broadband Services: <ul style="list-style-type: none"> Delivering broadband services to unserved and underserved communities Delivering higher bandwidth to support value-added services, like IPTV and OTT video Delivering higher bandwidth further in the network for backhaul applications
Network Service I/F	<ul style="list-style-type: none"> 10/100/1000 Base-T 100/1000/2500 Base-FX 	<ul style="list-style-type: none"> 10/100/1000 Base-T 100/1000/2500 Base-FX 	<ul style="list-style-type: none"> 10/100 Base-T 100/1000 Base-FX 	N/A	N/A
Copper I/Fs	<ul style="list-style-type: none"> Up to 256 copper pairs, 128 HSLs per shelf 2Base-TL (IEEE 802.3ah /ITU-T G.998.2 over Extended G.SHDSL) 	<ul style="list-style-type: none"> Up to 128 copper pairs, 64 HSLs per shelf 2Base-TL (IEEE 802.3ah /ITU-T G.998.2 over Extended G.SHDSL) 	<ul style="list-style-type: none"> Up to 8 copper pairs per unit 2Base-TL (IEEE 802.3ah /ITU-T G.998.2 over Extended G.SHDSL) 	<ul style="list-style-type: none"> 2 copper pairs per repeater 2Base-TL (IEEE 802.3ah / ITU-T G.998.2 over Extended G.SHDSL) 	<ul style="list-style-type: none"> Up to 2 ports per card
Topologies	<ul style="list-style-type: none"> Point-to-multipoint (CO) Stack Ring 	<ul style="list-style-type: none"> Point-to-multipoint (CO) Point-to-point (CO/RT) Stack Ring Linear Add/Drop 	<ul style="list-style-type: none"> Point-to-multipoint (CO) Point-to-point (CO/RT) Point-to-multipoint (RT/CPE) Stack Linear Add/Drop 	<ul style="list-style-type: none"> Up to 8 repeaters (9 hops per link) Up to 4 repeaters line powered with one Remote Power Feeding Unit (PFU) Dual-side feeding Power feeding in both point-to-point and point-to-multipoint topologies 	<ul style="list-style-type: none"> Connected to DSLAM at the CO or Remote cabinet Flexible placement between CO and CPE ABA - loop range is up to 26 kft (26 AWG). ABA models available are: <ul style="list-style-type: none"> ABA-SR: Optimized for short to medium loops; ABA-ER: Optimized for longer loops, BBA placed further from the CO; ABA-SC: Optimizing for short to medium loops and spectrally configurable. VBA - The VBA enables to expand high bandwidth services such as 25, 50 Mbps to more customers located further from the DSLAMs/COs with bandwidth gains of 35-40%
Main Features	<ul style="list-style-type: none"> High-density solution: 64 ports /RU, up to 128 HSLs offering Ethernet over bonded-copper links Bonding up to 32 pairs Up to 15Mbps/pair and in excess of 400 Mbps/link Ethernet L2 network processor Hybrid copper and fiber interfaces Multiline card configuration Fully redundant configuration Carrier Grade 	<ul style="list-style-type: none"> Compact point-to-multipoint Up to 15 Mbps/pair, Up to 100 Mbps/link Hybrid copper and fiber interfaces 	<ul style="list-style-type: none"> Above 10 Mbps/pair (Dependent on repeater spacing and/or copper quality) DRB-friendly support Fully managed Outdoor hardened Compliant to 239-based field enclosures and compatible with other customer-specific enclosures 	<ul style="list-style-type: none"> Transparent to existing CO and CPE equipment No external power required; leverages POTS power Passive Node Technology; no provisioning or active management required Hardware bypass provides POTS protection Environmentally hardened and waterproof for extreme environments Very high MTBF Enclosures (see pictures above) IP68 <ul style="list-style-type: none"> 2 cards (4 ports) or 12 cards (24 ports) - Multi Slot Enclosure (MSE) 	
Shared Features	<ul style="list-style-type: none"> IEEE 802.3ah EFM Actelis EFMplus, DRB, DRB friendly and DSS Up to 1Gbps over Fiber, Multiple fiber interfaces 	<ul style="list-style-type: none"> Wire speed switching L2 & L3 Classification IEEE 802.1Q VLAN and VLAN stacking 			
Regulatory Compliance/Certifications	<ul style="list-style-type: none"> CE 1,0 - MEF 9, 14 CE 2,0 - ML2300 / ML230 Certified IEEE 802.3ah, ITU-T G.998.2 ITU-T G.991.2 ETSI TS 101 524 FCC part 15 UL 60950 	<ul style="list-style-type: none"> NEBS 3 ITU-T K.20/K.21 CE 	   	<ul style="list-style-type: none"> ANSI T1.417-2003 IEEE 802.3ah, ITU-T G.998.2 ITU-T G.991.2, ETSI TS 101 524 FCC part 15 UL 60950 CE ITU-T K.45 NEBS 1 	<ul style="list-style-type: none"> ITU G.993.2 VDSL2 (bandplan 998, Annex A), G.992.5 ADSL2+ Annex A, G.992.3 ADSL2 Annex A, G.992.1 ADSL Annex A Metalic Loop Testing (i.e., MLT and 4Tel) CE-EMC and safety compliant FCC part 15 class B certified WEEE, RoHS compliant IP-68 compliant
Spectral Compliance	<ul style="list-style-type: none"> ITU-T G.991.2 (Annex A, B, F, G) ETSI TS 101 524 (Annex E) ANSI T1.417, T1.426 Per country regulatory compliant spectral modes 			<ul style="list-style-type: none"> Fully standards and spectrally compliant, including ANSI T1.417 	<ul style="list-style-type: none"> Fully standards and spectrally compliant