



Calix E9-2 Intelligent Edge System

DESCRIPTION

The revolutionary Calix E9-2 Intelligent Edge System is designed to deliver unconstrained scale and bandwidth enabling service providers to converge mobile, business and residential services networks. This convergence as well as the E9-2's ability to redefine the access edge of the network by collapsing functions into a single system, enables service providers to realize dramatic reductions in total cost of operations and ownership. The Calix E9-2, built on the AXOS platform – Access eXtensible Operating System, allows service providers to deploy rapidly and meet the demands of the always on world.



FUNCTIONAL DESCRIPTION

The Calix E9-2 Intelligent Edge System consists of one or more E9-2 shelves. The E9-2 is an unconstrained, disaggregated system that utilizes the latest in data center high bandwidth interconnect technology to enable it to scale to very high density, non-blocking capacity. The E9-2 is aggregated into a single system when utilizing the System Aggregation and Control cards (CLX3001). The architecture of the E9-2 enables line cards to support nonblocking uplink capacity and as new technologies are incorporated the system easily integrates new uplink options.

REDEFINED ACCESS EDGE:

The E9-2 collapses the functions of the traditional OLT, the aggregation switch and the edge router with subscriber management into a single system reducing the rack space and power used in the data center / central office and more importantly reducing the number of systems required to be provisioned and managed.

CARRIER GRADE SYSTEM:

The E9-2 Intelligent Edge System enables full carrier grade redundancy for network and equipment connections. In addition, it provides redundancy on the access network utilizing NG-PON2 wavelength mobility and Type B protection for GPON.

INTEGRATED CABLE AND FIBER MANAGEMENT:

The E9-2 system supports cable and fiber management, which ensures operators can easily install and remove additional cards without having to remove cables or fibers from any other card in operation. Additionally, there is an optional air filter / fiber cover that snaps to the front of the chassis.

LINE CARD SUPPORT:

The E9-2 shelf has 2 universal line card slots. Access line cards can be mixed and matched within the system and additional shelves can be aggregated to increase subscriber density.

CONVERGED SERVICES NETWORKS:

The E9-2 enables convergence of residential, business and mobile services into a unified access network. E9-2 delivers scalable residential IPTV, high-speed internet (HSI), voice and business services. In addition, the E9-2 supports high value business class services allowing operators to use a common access network to deliver higher revenue generating opportunities.

INDUSTRY STANDARDS COMPLIANCE:

The E9-2 meets all applicable industry compliance standards, including NEBS Level 3, UL, FCC and CE mark.

MINIMUM SOFTWARE RELEASE

Calix E9-2 AXOS Release 3.1 or greater for
NG1601 and CLX3001
Calix E9-2 AXOS Release 4.1 or greater for GP1611

SLOTS PER SHELF

2 Universal card slots
4 Fan module slots

VIRTUAL BACKPLANE

Enabled by the System
Aggregation
and Control cards CLX3001
(see appropriate datasheet)

MANAGEMENT INTERFACES

2 Ethernet 10/100/1000 (RJ-45 connectors on back of E9-2)
2 RS-232 (RJ-11 connectors on back of E9-2)
1 Ethernet 10/100/1000 (RJ-45 connector on the front of each line card)

DIMENSIONS (W x H x D)

Width: 17.44" (44.3 cm)
Height: 3.44" (8.7 cm)
Depth: 17.94" (45.5 cm)
Rack height is 2 RU

WEIGHT

16 lb (7.2 kg) E9-2 shelf
19.4 lb (8.8 kg) shelf with four Fan Modules

POWER DISSIPATION

Maximum power 600 watts
per shelf

POWER FEEDS

Integrated power management on
Calix E9-2 line cards
Redundant -48 VDC battery feeds
(A and B)
Input Range: -42.5VDC to -56VDC

OPERATING ENVIRONMENT

Temperature: 23° to +131° F
(-5° to +55° C)
Humidity: 5 to 95%
(non-condensing)
Operating altitude: 10,000 ft
(3,049 m)

STORAGE ENVIRONMENT

Temperature: 23° to +131° F
(-40° C to +85° C)
Humidity: 5 to 95%
(non-condensing)

ALARM I/O INTERFACES (PER SHELF)

Wire wrap pin access on
E9-2 back
User definable alarm inputs: 3,
outputs: 1

AIR FILTER

Field Replaceable from front of
chassis (no tools required)

COMPLIANCE

UL-60950, Standard for Safety,
Issue 1, April 1, 2003
NEBS Level 3 compliance
(GR-63-CORE, GR-1089-
CORE, GR-3028)
FCC Part 15 Class A
CE mark (on chassis and entire
system)

SYNCHRONIZATION

Synchronization is enabled by
the E9-2 line cards as
required with internal and/
or external reference timing

TIMING

INPUTS

INTERFACES

4-wire wire wrap pins on the
back of the E9-2
T1/E1 BITS clock (sink)

FIBER INTERFACES

All optical ports use pluggable
optics (SFP, XFP, SFP+,
QSFP+,QSFP-28)
LC or SC connectors on modules

COPPER INTER-CONNECTS

Pluggable cables : C-QSFP
(4x100GE)



NOTES

For NGPON-2 OIM, XGS-PON, GPON OIM, 10GE XFP, 10GE SFP+, 40 GE QSFP+ and 100GE QSFP28 pluggable transceivers and Direct Attach cables, only products purchased from Calix are supported. The use of NG-PON2, XGS-PON, GPON OIM, 10GE XFP, 10GE SFP+, 40GE QSFP+ and 100GE QSFP28 pluggable transceivers and Direct Attach cables not purchased directly from Calix is not supported and will void all product warranties covering the Calix equipment to which such third-party materials are connected.

Copper Direct Attach cables can operate in SFP, SFP+, QSFP+, QSFP28, C-QSFP sockets at 1GE, 10GE, 40GE, 100GE, 4x100GE data rates, respectively, as supported by the card type.

CALIX E9-2 ETHERNET SERVICE ACCESS PLATFORM

000-00916..... E9-2 System Package (Shelf, 4 Fan Modules, Fiber Management, Installation Kit)

100-00573..... Calix Circuit Breaker Panel (90 Amp total, 3x 30 Amp positions with A/B protection)

CALIX E9-2 SYSTEM RECOMMENDED SPARE COMPONENTS

100-04469..... E9-2 Shelf

100-04470..... E9-2 Fan Module

100-04471..... E9-2 Air Filter / Cover

100-04715..... E9-2 Installation kit

100-04472..... 100G QSFP28 Direct Attach Cable, 1m

100-04489..... QSFP28 to 4 x SFP+ Direct Attach Breakout Cable, 3m

100-04713..... 4x100G C-QSFP to 4 x QSFP28 Direct Attach Breakout Cable, 1m

100-04714..... 4x100G C-QSFP to 4 x QSFP28 Direct Attach Breakout Cable, 3m

100-04716..... Air filter replacement

100-04746..... Blank Line Card

CALIX PLUGGABLE TRANSCEIVER MODULES

The E9-2 supports pluggable modules for all service and network interfaces. Refer to the Calix Optical Transceiver Modules Datasheet (#250-00191) for a complete list of modules and specifications.

SFP..... 1GE and 2.5GE optical and copper Small Form-factor Pluggable (SFP) modules

SFP+ 10GE optical Enhanced Small Form-factor Pluggable (SFP+) modules

SFP+ Direct Attach..... Multi-rate copper Small Form-factor Pluggable (SFP/SFP+) cables

XFP 10GE optical Small Form-factor Pluggable (XFP) modules

QSFP+..... 40GE optical Quad Small Form-factor Pluggable (QSFP+) modules

QSFP28 Direct Attach 40GE-100GE Quad Small Form-factor Pluggable (QSFP-28) Direct Attach Cables

QSFP28 DAC Break Out 40GE to 4x10GE, QSFP to 4 SFP+ Direct Attach Breakout Cable

C-QSFP-QSFP28 DAC Break Out.... 4x100GE C-QSFP to 4 x QSFP28 Direct Attach Breakout Cable

GPON OIM 2.5Gbps GPON (Class B+ ODN with minimum 28dB link budget)

ER-GPON OIM 2.5Gbps Extended Reach GPON (up to 40 km with 1:8 split)

NG-PON2 OIM NG-PON2 XFP 10/10Gbps, Class N1 (1596.34nm, 1597.19nm, 1598.04nm, 1598.89nm)

XGS-PON OIM XGS-PON XFP OIM 10/10Gbps, 1577/1270nm