

OPTICAL ETHERNET + emulated services MSP-CES



FEATURES & BENEFITS

- Industry-leading solution optimized for mobile backhaul applications and technologies (2/3/4G) backed by wide range of synchronization options (e.g., Sync-E and IEEE1588v2) and 10G DWDM transport
- Circuit Emulation based on MEF-8 and MEF-18 CEsSoETH CE technology.
- Modular solution that enables scalable network capacity allocation using multiple Gigabit Ethernet ports and various TDM (DS1, DS-3, and OC-3) ports.
- Full interface-configuration flexibility: any port can function as either network or client port
- Low-cost solution that integrates switching, aggregation and DWDM transport in 1RU and low power consumption
- Complete set of Ethernet OAM functions using ITU-T Y.1731, IEEE 802.1ag, and IEEE 802.3ah enabling the customer's full control at the end-to-end service level, link level, and node level.
- VLAN-based routing with strict-QoS
- Various options of point-to-point and ring protection switching supported on all ports
- Extensive management features; CLI, WEB, SNMP-v2c with in-band and out-of-band support
- QoS service routing allows differentiated services
- Dual hot-swap PSUs (Power Supply Units) and dual modular fans
- Built-in media transceivers
- Mounting kit for 1RU of space with fiber mgmt

Description

IPITEK's MSP-CES (Circuit Emulation Services) is a modular small-size 1RU platform that provisions both TDM and packet services over an Ethernet transport network. The MSP-CES helps operators to significantly cut costs by providing a low-cost solution that carries all types of legacy TDM and packet traffic. The MSP-CES's modularity enables the customer to choose from wide range of interfaces types and capacities to exactly match its network evolution needs. The MSP-CES is a leading solution optimized for cellular

mobile backhaul applications by supporting multiple synchronization options such as IEEE 1588v2 and Synchronous Ethernet while providing 10G DWDM capacity. As a result, the MSP-CES is the industry-only solution that meets the stringent **Synchronization** and **Capacity** requirements of all mobile technology generations such as GSM, UMTS, CDMA2000, and the emerging WiMAX and LTE standards. In addition, the MSP-CES model complements the MSP-10GE-and MSP-1GE models by providing a modular Ethernet ADM multiplexer that creates Metro Ethernet-based transport networks. These networks can scale to 4000 Ethernet E-Line (Pt-Pt) or E-LAN (Multipoint) circuits per network. The use of all optical interfaces provides the ability to combine up to 24 remotely located fiber-attached sites via 1GE links per site onto a 10GE LAN Native Ethernet protected backbone, while only consuming 1RU of rack space and 80 watts of protected DC power.

Interfaces

The MSP-CES contains 3 slots. Slots 1 and 2 holds the TDM PIMs and Slot 3 holds the Ethernet PIM. TDM PIMs have several choices: 4 DS1 ports, 3 DS3 ports, or 1 OC-3 port in a single PIM. Each PIM uses a Gb-E link into the switch module. Two Ethernet switch PIMs (1GE and 10GE) are available. Both PIMs support 4 SFP transceivers and 8 RJ-45 ports for additional Gb-E links. In addition, the 10GE switch PIM supports 2 additional XFP 10GE ports to make the choice of Ethernet links even more staggering and meet the increasing traffic demands.

Topologies

Any port on the MSP-CES can be configured as either network interface or client interface, thus supporting any topology from point-to-point, linear ADM, ring and mesh. Repeater and transponder mode are also supported. Each EVC can be set uniquely to forward, drop, or drop and continue at any node thus creating E-Line or E-LAN circuit topologies. A traditional 1GE network topology between MSP-CES sites can support Ethernet Metro Business Service networks where MSP-1GE CPE switches with optical uplinks are fiber connected to the 1GE ports.

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Timing and Synchronization

Timing and synchronization is a major aspect to ensure accurate operation of TDM circuits. The MSP-CES provides several options of timing and synchronization to distribute clocks that meets and exceeds ITU-T G.823, G.824, and G.8261 clock-quality specifications in order to meet wide range of applications with different requirements:

- ✍ Synchronous Ethernet (Sync-E) per ITU-T G.8261, G.8262, and G.8264
- ✍ Timing over Packet Protocol (PTP) using the Latest IEEE1588 standard (IEEE1588v2)
- ✍ Adaptive Clock Recovery
- ✍ Internal Oscillator (Stratum 3/3e)
- ✍ External Timing using Dual BITS Inputs
- ✍ Timing using GPS
- ✍ Line/Loop Timing

Moreover, these synchronization options can be prioritized and are fully controllable by the user. In addition to supporting wide range of application-specific synchronization requirements, this versatility increases the robustness of the synchronization distribution in the network.

OAM and Monitoring

OAM is a keystone for building service-centric carrier-grade networks. The MSP-CES integrates several standards-based OAM functions that helps the operator monitor the health of the network and meet the SLA requirements of the carried services. The MSP-CES OAM suite includes IEEE 802.1ag, ITU-T Y.1731, and IEEE 802.3ah. In addition, optical power levels, Ethernet layer statistics and alarms are provided for each interface. Local logs of all command entries and events further simplifies trouble shooting. SNMP-v2c notifications are also provided.

Applications

The MSP-CES was designed to efficiently serve the requirements of wide range of applications with different capacity, QoS, synchronization, ... etc requirements. To achieve this, the MSP-CES is equipped with many features and functions; added to its modularity, the MSP-CES can solve challenging problems facing network operators in achieving high-performance cost-efficient networking. Below are examples of applications, however, this is not an exhaustive set of such applications:

- ✍ **Wireless Mobile Backhaul:** The MSP-CES provides solutions for the major mobile backhaul challenges such as supporting multiple mobile operators at the same location which is met by the MSP-CES support for wide range of interface types and rates. In addition, it accurately and independently synchronize each mobile operator since by providing several synchronization options. For example, while certain cell towers requires accurate frequency synchronization in which Sync-E is used, others may demand phase and time synchronization and IEEE 1588v2 or even GPS timing can be used.
- ✍ **Business Services:** The MSP-CES is highly customizable solution with wide range of card-type support per each slot and wide range of port-type support per card. The ratio of TDM-vs-Ethernet support is fully user controlled. Hence, the customer can support all types of applications such as VoD, IPTV, Internet services, and TDM circuit emulation using a single, highly-customizable, solution across the whole network.

Reliable Transport

Point-to-point and ring protection switching is offered on all ports. Any two ports can be logically bundled as a protection switching group and up to 6 independent groups are supported per node. Any group can be enabled to participate in point-to-point or ring protection. This logical separation ensures that a fiber break in one protected ring does not impact other rings connected to the same MSP-CES.

Provisioning

The unit can be either locally provisioned using CLI or a Web Browser. When a maintenance LAN is configured, remote management via CLI over TELNET, Web Browser, or SNMP via the full-featured MIBs supports device level centralized provisioning. To further simplify provisioning IPITEKs NodeWizard EMS can support end-to-end circuit-level provisioning for the entire interconnected network or even multiple IPITEK networks. Ease-of-provisioning has been given special attention where CES has borrowed from the powerful CLI of MSP-10G and MSP-1G while adding in the multi-slot commands

SPECIFICATIONS

Ethernet Interface Support

8 x 10/100/1000 Rj45 plus 4 ea SFP 1Gig Switch module
2 x 10GE XFP plus 4 x SFP plus 8 x Rj45. 10Gig Switch module

Power

Input voltage -42 to -56 VDC (GR513)
Power consumption: 80 watts max
BTU/hr: 276 BTU

Environmental

Operating temperature: 0° to 50°C
Storage temperature: -40° to +75°C
Relative humidity: 10 to 90%

Physical

Chassis dimensions: 17" x 15" x 1.75"
(43.18cm x 38.1cm x 4.44cm)
Chassis weight: 14.2 lbs. loaded
Rack mount requirements: 19" or 23" EIA cabinet or open-frame rack

Provisioning

Craft DB9 RS232 Async
Network mgmt 10/100BASE-T (OOB rear port)
Protocol Telnet, SSH, HTTP/S, SNMP-v2c
Software download Dual flash bank, FTP, TFTP
Upload/download config FTP, TFTP
In-band mgmt via a unique VLAN is supported on any front port

Base Units

MSP-CES-AC Base unit, 1 AC PSU, no slot1 or 2 PIM, no slot 3 switch
MSP-CES-DC Base unit, 1 DC PSU, no slot 1 or 2 PIM, no slot 3 switch

Slot 3 Plug-in Interfaces

MSP-1GE -12P 4 SFP plus 8 Rj45 port slot 3 Gig-E switch module
MSP-10G-14P 2 XFP plus 4 SFP plus 8 Rj45 10Gig-E switch module

Slot 1 and 2 Plug-in Interfaces

MSP-CES-4DS1
MSP-CES-3DS-3
MSP-CES-10C-3

Dual fiber SFP's

MSP-SFP-E-SX: <550meters via MMF, 850nm, dual LC/UPC connectors, diagnostic with optical PM
Note: The exact distance on MMF depends on the fiber core diameter & modal bandwidth
MSP-SFP-E-LX: 10km via SMF, 1310nm, dual LC/UPC connectors, diagnostic with optical PM
MSP-SFP-E-EX: 40km via SMF, 1310nm, dual LC/UPC connectors, diagnostic with optical PM
MSP-SFP-E-ZX: 80km via SMF, 1550nm, dual LC/UPC connectors, diagnostic with optical PM
MSP-SFP-E-CXX: 80km via SMF, 8 ch CWDM, dual LC/UPC connectors, diagnostic with optical PM
MSP-SFP-E-DXX: 80km via SMF, 40 ch DWDM @ 100Ghz, select ITU ch #, dual LC/UPC connectors, diagnostic with optical PM

Single fiber SFP's

MSP-SFP-E-BLx: 10km via SMF, A=1310nm, B=1490nm, single LC/UPC connector, diagnostics with optical PM
MSP-SFP-E-BEx: 40km via SMF, A=1310nm, B=1490nm, single LC/UPC connector, diagnostics with optical PM
Note: x = A or B. Type A must be paired with type B on the same link

Security

- Tiered access privileges
- RADIUS Server
- HTTPS
- Secure Shell (SSH) v2
- Access Control Lists (ACL)
- Custom SNMP string and access privileges
- Disable Telnet, HTTP, HTTPS and any front port
- Automatic logout from management interface

Monitoring

- Extensive monitoring of base unit
- Full Ethernet OAM support per IEEE 802.1ag, ITU-T Y.1731, and IEEE 802.3ah
- Optical power, temperature and current levels on optical ports
- Layer 2 statistics and utilization on all ports
- Event notification on user configurable thresholds
- Local logs of all command entries and events
- Syslog

Quality of Service

- 4 queue levels and 8 priority levels with remapping based on input 802.1p or DSCP
- Strict queueing with guaranteed bandwidth allocation
- Rate shaping and policing per port

ORDERING INFORMATION



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IPITEK reserves the right to modify product specifications without prior notification.

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