

OPTICAL ETHERNET + emulated services MSP-CES



FEATURES & BENEFITS

- Industry-leading solution optimized for mobile backhaul applications and technologies (2/3/4G) backed by multiple synchronization options (Sync-E, BITS) and 1GE DWDM transport
- Circuit Emulation based on MEF-8 and MEF-18 CESoETH CE technology.
- Modular solution that enables scalable network capacity allocation using multiple Gigabit Ethernet ports and various TDM ports - T1/E1, T3/E3, and OC-3/STM1.
- Full interface-configuration flexibility: any port can function as either network or client port
- Tunnels MPLS and MPLS-TP transparently over Carrier Ethernet
- Low-cost solution that integrates switching, aggregation and DWDM transport in 1RU.
- Low power consumption (80 Watts max)
- Complete set of Ethernet OAM functions using ITU-T Y.1731 and IEEE 802.3ah, enabling the customer's full control at the end-to-end service level, link level, and node level.
- VLAN-based switching with strict QoS
- Various options for point-to-point and ring protection switching supported on all Ethernet 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 management

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 significantly cut costs by providing a low-cost solution that carries various types of legacy TDM and packet traffic. The MSP-CES's modularity enables you to choose from wide range of interfaces types and capacities to exactly match your network evolution needs.

The MSP-CES is a leading solution optimized for cellular mobile backhaul applications by supporting Synchronous Ethernet and 1G DWDM capacity. The MSP-CES can also be combined with IPITEK's MSP-1588 for a highly accurate clock based on IEEE 1588v2 Precision Time Protocol (PTP). 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 to create flexible and robust Metro Ethernet-based transport networks. These networks can scale to over 4000 Ethernet E-Line (Point-to-Point) 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 on to a 10GE LAN Native Ethernet protected backbone, while only consuming 1RU of rack space and a maximum of 80 watts of protected DC power.

Interfaces

The MSP-CES contains 3 slots. Slots 1 and 2 hold the TDM PIMs and Slot 3 holds the Ethernet PIM. TDM PIMs have several choices: 4 T1/E1 ports, 3 T3/E3 ports, or 1 OC-3/STM1 port in a single PIM. Each PIM uses a 1 gigabit Ethernet link into the switch module. The 1GE switch PIM supports 4 SFP transceivers and 8 RJ-45 ports for additional 1GE links.

Topologies

Any Ethernet port on the MSP-CES can be configured as either a network interface or a client interface. This supports any topology from point-to-point, linear Add/Drop Multiplexer (ADM), ring and mesh. Repeater and transponder modes are also supported. Each Ethernet Virtual Circuit (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 are major aspects needed to ensure accurate operation of TDM circuits. The MSP-CES provides several options of timing and synchronization that meet and exceed ITU-T G.823, G.824, and G.8261 clock-quality specifications. The following options are needed to meet a 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) utilizing the latest IEEE1588v2 standard; used in conjunction with IPITEK's MSP-1588 platform.
- Internal Oscillator (Stratum 3/3e)
- External Timing using Dual BITS Inputs

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

OAM and Monitoring

OAM is a keystone for building service-centric carrier-grade networks. The MSP-CES integrates several standards-based OAM functions that help the operator monitor the health of the network and meet the service requirements of the carried services. The MSP-CES OAM suite includes 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 and synchronization requirements. To achieve this, the MSP-CES is equipped with many features and functions needed for 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 major mobile backhaul challenges, such as supporting multiple mobile operators at the same location. This is met by supporting a wide range of interface types and rates. In addition, the MSP-CES accurately and independently synchronizes each mobile operator 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 utilized by IEEE 1588v2 or even GPS timing. IPITEK's MSP-1588 can be used in conjunction with MSP-CES in order to meet these needs.
- **Legacy Business Services:** The MSP-CES is highly customizable solution with a 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 Ethernet 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 supports device level centralized provisioning via CLI over TELNET/SSH, Web Browser, or SNMP via the full-featured MIBs. To further simplify provisioning, IPITEK's NodeWizard Network management System (NMS) 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 the MSP-CES has borrowed from the powerful and easy-to-use CLI of IPITEK's MSP-10GE and MSP-1GE.

SPECIFICATIONS

Ethernet Interface Support

8 x 10/100/1000 Rj45 plus 4 SFP 1Gig 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

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 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
- Broadcast / multicast policing per port

ORDERING INFORMATION

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

Slot 1 and 2 Plug-in Interfaces

MSP-CES-4 T1/E1
MSP-CES-3 T3/E3
MSP-CES-1 OC3/STM1

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



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