General DataComm

OCM 1000

OFFICE COMMUNICATIONS MANAGER

OVERVIEW General DataComm's OCM 1000 is a Hybrid Access Networking Device (HAND) for point-to-point, point-to-multipoint, and point-to-network applications with a growth path to the power of the TMS 3000 system.

The OCM 1000 offers connectivity to a variety of carrier services, allowing users to select the configuration with the best cost/performance ratio for their network environment. These service options include 9.6 to 28.8 Kbps analog services; 56/64 Kbps leased line services; fractional T1/E1 services (groomed N x 56/64 Kbps services); and T1/E1 services.

The OCM 1000 offers investment protection becuase it can be upgraded to participate in a large Transport Managment System (TMS) backbone network simply by swapping a common logic module. There is no need to discard network equipment and the initial investment as requirements grow.

ARCHITECTURE The OCM 1000 is extremely flexible. It supports up to two full E1 (2.048 Mbps) or T1 (1.544 Mbps) aggregates. The base system accommodates both circuit and packet switched operation. Plug-in cards use the backplane architecture to implement various circuit and packet capabilities.

APPLICATION SUPPORT The OCM 1000 supports a comprehensive range of applications, including LAN internetworking, videoconferencing and imaging, as well as traditional voice and data applications. These applications are consolidated and transported across a single communications path between OCM 1000s. Brief discussions of common OCM 1000 applications follow.

PRIVATE NETWORK ACCESS The OCM 1000 serves used as a multiple aggregate network multiplexer for small private networks. It is configurable to access the private network over public or private transmission facilities, via either narrowband or wideband circuits. In a private network, up to four remote OCM 1000s are supported via the OCM 1500 split shelf.

PUBLIC NETWORK ACCESS In a public network, the OCM 1000 provide sT1/E1 bandwidth provisioning service. The OCM can deliver 24 (T1) or 31 (E1) 56/64 Kbps channels for cross-connection at a carrier's central office. A channel from one T1/E1 interface may be cross-connected to another wideband interface, or provisioned as a narrowband circuit terminating on a CSU or DSU. Channels can also be cross-connected to the carrier's frame relay service.

INTEGRATED TURBO DATA COMPRESSION Using the public network to "groom" 56/64 Kbps data, the OCM 1000 provides integral data compression with throughput rates exceeding 256 Kbps. This arrangement can rival the cost/performance benefit of public frame relay service by providing fractional T1/E1 throughput on 56/64 Kbps circuits.

A single OCM can combine multiple remote data compression channels onto one T1/E1 aggregate while providing end-to-end management and statistics of the compressed data network.

LAN BRIDGING AND ROUTING With the OCM Packet Processor (OPP) module, LAN bridging and routing functions are integrated into the OCM 1000. Through the OPP, the OCM 1000 supports full LAN connectivity across the network in both homogeneous (Ethernet-Ethernet and Token Ring-Token Ring) and heterogeneous environments (Ethernet-Token Ring). This powerful capability provides LAN segmentation for local LANs in the small business environment, as well as connection to a remote location over digital services.

PRODUCT HIGHLIGHTS

- ***Hybrid public network access***
- ***Integrates LAN, voice, fax, data, image and video applications***
- ***Flexible inter-connection speeds to 2 Mbps***
- ***Automatic dial restoral for continuous communications***
- ***Module redundancy to maximize equipment reliability***
- ***Powerful PC-based network management supports up to 93 OCM 1000s***
- ***Smooth migration path to more advanced networking features***

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The OCM also supports all major LAN internetworking methods: Self Learning (Spanning Tree) bridging, IBM's Source Routing, and Multiprotocol Routing (including TCP/IP and IPX).

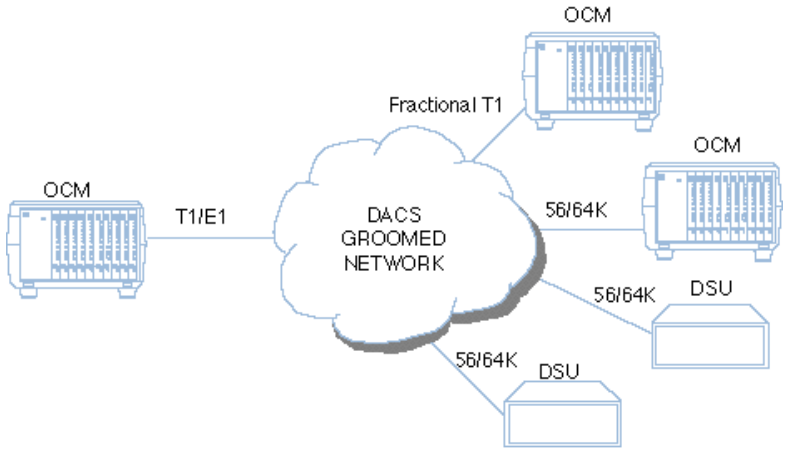
In T1/E1 groomed environments, the OPP acts as an IP/IPX FRAD, allowing LAN traffic to be encapsulated in frame relay and groomed to a public frame relay network.

VOICE APPLICATIONS Users can satisfy virtually any voice application by selecting from numerous OCM 1000 options. The ADPCM module provides voice at user programmable speeds of 64, 32, 24 or 16 Kbps. The Dual Private Voice (DPV) Module is a two-channel analog voice compression module that operates at speeds of 4.8, 6.4, 8 or 9.6 Kbps. The DPV module is designed so that all signaling is performed in-band, with no hidden bandwidth costs.

Each voice channel supports 2- and 4-wire analog connections and can be configured for different signaling requirements. Digital echo cancellers enhance performance on satellite and long distance terrestrial links.

GDC's voice compression techniques provide excellent voice quality using as little as 4.8 Kbps of bandwidth, and near toll-quality using only 9.6 Kbps. In addition, automatic full rate Group III fax bypass ensures that the voice channels can be used for both voice and fax transmission without manual intervention or reconfiguration.

T1/E1 Groomed Network

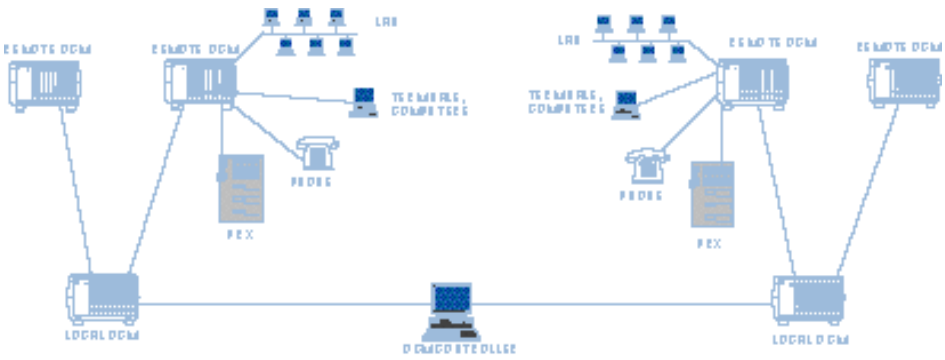


DATA APPLICATIONS The OCM 1000 offers a variety of data channel modules, including a dual data channel module, and a single, high speed data channel module. The dual version supports two independent EIA/TIA-232E/V.24 data channels at speeds up to 38.4 Kbps. The single channel, high speed data module supports a variety of interfaces, including V.35, V.11, RS-422 and X.21 and speeds up to 1.920 Mbps.

AGGREGATE DIVERSITY For mission critical applications requiring fail-safe operation, reliable networking equipment is not enough. Most network outages are a result of carrier line failures, not equipment failures. To protect against line failure, the OCM 1000 provides an aggregate diversity feature. In the event of primary line failure, the OCM 1000 automatically transfers all traffic to an alternate physical path.

DIAL-UP RESTORAL The OCM 1000 can also initiate automatic restoral of failed circuits via the switched network. Upon detection of line failure, the OCM 1000 can signal an ISDN Terminal Adapter, modem or other device to dial-up a connection. Once the connection is established, the OCM 1000 will use the restored path to resume normal communications. This important feature, coupled

Multipoint Networking With OCM



with equipment redundancy, ensures continuous communications service.

PACKAGING The OCM 1000 is available in three basic configurations: a 16-slot, 19-inch rack-mount shelf, a 10-slot desktop enclosure, or a dual 8-slot, 19- inch "split" shelf.

The OCM 1000 16-slot shelf is 7 inches high and 19 inches wide, supports 16 card slots and can be expanded to include up to a total of 32 card slots with the OCM Expansion Shelf. At least one slot each is required for a Common Control Module (CCM) and a Line Interface Module (LIM). The OCM 1000 shelf supports optionally redundant power supplies, CCMs and LIMs.

The OCM 1110 Desktop Enclosure is an attractive desktop unit which supports 10 card slots (not expandable). At least one slot each is required for a CCM and a LIM. The power supply is non-redundant.

The OCM 1500 split shelf is 7 inches high and 19 inches wide and supports two sets of 8 card slots. The OCM Split Shelf contains two separate 8-slot OCM 1000s in a single shelf. For each half of the shelf, at least one slot each is required for a CCM and a LIM. The power supplies are load sharing and can be configured for redundancy.

OCM USER CONNECTORS To facilitate rapid deployment of services and simplified maintenance, all user cables are connected to the rear of the OCM via standard connectors. T1/E1, analog voice, and LAN connections are made via industry standard RJ-45 modular jacks. Data connections are made via industry standard DB-25 connectors.

NETWORK MANAGEMENT The OCM 1000 is managed by GDC's OCM Management System (OMS), which runs on a standard IBM-compatible PC. The OMS provides intuitive configuration, alarm reporting, diagnostics, and full management of up to 93 OCM 1000s.

The OCM performs all management functions in-band, eliminating the need for external communication paths or dial-up modems. All functions, including performance measurements and alarm reporting, are transported between OCM 1000s using a small, user-configurable overhead channel.

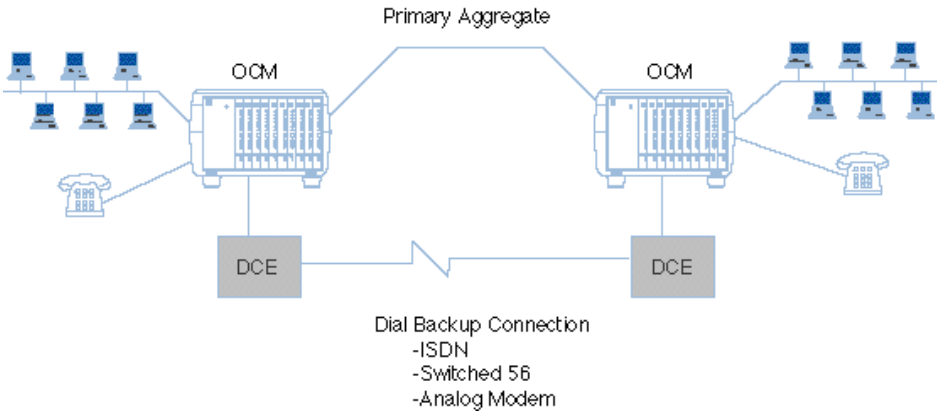
The OMS supports multiple OCM 1000 networks. A single OMS PC can manage up to 31 local OCM 1000s and 62 remote OCM 1000s.

All operation parameters, network configuration data, channel types, channel routing data, and alarm thresholds are entered using the OMS. The configuration parameters for all OCM 1000s in the network are automatically stored on the PC's hard drive by the OMS, and backup copies of the configuration can be saved on floppy disk.

SOFTWARE DOWNLOADABLE The OCM 1000 is completely software downloadable. Not just the operational parameters, but the actual OCM 1000 software can be downloaded to all units. This important feature eliminates the need to dispatch technicians to remote locations to perform upgrades as new OCM 1000 software becomes available.

DIAGNOSTICS Comprehensive network diagnostics may be engaged by the OMS to rapidly isolate network or equipment faults. In addition to supporting common local and remote loopback functions on all channel cards, the OMS can command the data channels to launch a variety of Bit Error Rate Tests (BERT) by placing a remote channel in loopback and generating a data pattern. Voice channels can be commanded to perform remote loopback while a local module launches a test tone and the OMS displays send and receive audio levels measured in decibels.

Automatic Dial Restoral



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SPECIFICATIONS

Aggregate Capacity:	Up to two (Up to four in OCM 1500)
Aggregate Rates:	Rates from 9.6 Kbps to 2.048 Mbps, including N x 64 Kbps rates
Aggregate Interfaces:	T1/D4/ESF, CCITT G.703, G.704, V.11, V.35, V.28, EIA/TIA-232-E

Line Interfaces

	Application	***No. of Ports***	***Rates Supported***	***Interfaces***
T1 CSU	T1/D4/ESF with Integral CSU	1	1.544 Mbps	D4/ESF - 8 Pin Modular
T1	T1/D4/ESF	1	1.544 Mbps	D4/ESF - 8 Pin Modular
E1	G.703/G.704	1	2.048 Mbps	G.703/G.704 - 8 Pin Modular
V.11/X.21	N x 56/64 Kbps Digital Service	1	N x 56/64Kbps to 1.984 Mbps	ITU-T V.11/X.21
V.35	N x 56/64Kbps Digital Service	1	N x 56/64Kbps to 1.984 Mbps	ITU-T V.35
Subrate	Analog Services	1	N x 2.4 Kbps: from 9.6 Kbps to 45.6 Kbps N x 8 Kbps: from 16 Kbps to 64 Kbps	EIA/TIA-232-E

*Channel Capacity**

Shelf:	Up to 30 slots available (in the two shelf configuration) to support as many as 60 channels
Enclosure:	Up to 8 slots available to support as many as 16 channels

Channel Cards

	Application	***No. of Chls***	***Rates Supported***	***Interfaces***
Dual Data Card	Low Speed Sync/Async	2	300 bps to 38.4 Kbps	EIA/TIA-232-E, V.24
High Speed Data	High Speed Data	1	300 bps to 1.920 Mbps	EIA/TIA-232-E, 422, 423 and V.35, X.21
ADPCM Voice	Analog Voice	1	16, 24, 32 and 64 Kbps,	2/4 Wire E&M, FXS, FXO
CELP	Voice and Group 3 Fax	1	9.6, 6.4 and 4.8 Kbps	2/4 wire E&M, FXS, FXO
DPV	Voice and Group 3 Fax	2	9.6,8.0, 6.4 and 4.8 Kbps	2/4 wire E&M, FXS, FXO
OPP Token Ring	LAN Bridging/Routing and Frame Relay	1 LAN, 1 Serial	4/16 Mbps LAN to 2 Mbps Serial	10BaseT, V.35, EIA 422
OPP Ethernet	LAN Bridging/Routing and Frame Relay	1 LAN, 1 Serial	10 Mbps LAN to 2 Mbps Serial	10BaseT, V.35, EIA 422

Physical/Environmental

	16-slot Shelf/Split Shelf	***10-slot Enclosure***
Height:	178 mm (7.0 in.)	229 mm (9.0 in.)
Width:	483 mm (19.0 in.)	343 mm (13.5 in.)
Depth:	305 mm (12.0 in.)	292 mm (11.5 in.)
Weight:	46 kg (21 lbs)**	33 kg (15 lbs)***
Shipping Weight:	55 kg (25 lbs)	44 kg (20 lbs)

Note: 16-slot Enclosure uses EP-5 cabinet with a 16-slot Shelf

Power:	
16-slot Shelf	Each shelf accepts one or two 96-watt power supplies; 100/117 VAC, 220 VAC, 240 VAC or –48 VDC
10-slot Enclosure	One 100-watt power supply; 100/117 VAC, 220 VAC or 240 VAC
Temperature:	
Operating:	0º to 50º C (32° to 122° F)
Storage:	-40° to 85° C (-40° to 168° F)
Humidity:	Up to 95% without condensation
Altitude:	Up to 3000 meters (12,000 ft.)

*Channel capacity varies based on specific configurations.
**Includes two power supplies, no cards.
***Includes one power supply.

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