



CMS[®] 400

Milgo Management System

- Centralized LAN/WAN management
- PC-based network management
- Modular client/server architecture
- SNMP agent management
- Network diagnostic control
- Multiple concurrent functions
- Advanced script automation
- Microsoft Windows support
- Multiple user system
- CMS 802x support for remote diagnostics
- Y2K compliant with CMS 400 version 5.1

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Simple Management of Complex Networks

Today's global economy requires increased emphasis on an integrated management system that incorporates the diverse elements of a corporate network. The competitive nature of business demands an adaptable and efficient system that can easily accommodate network expansion and change.

Communications Management Series (CMS[®]) 400, from Milgo Solutions, is a network management system with a modular architecture that accommodates the need for growth in network management services. Some of the many features of CMS 400 are: centralized network control, simple user presentation, powerful function automation, and efficient execution tools.

CMS 400 delivers extensive management capabilities and control over your entire local and wide area networks...minimizing error rates and disruptive service. It is designed to preserve your investment in both network management equipment and personnel training.

LAN/WAN Support

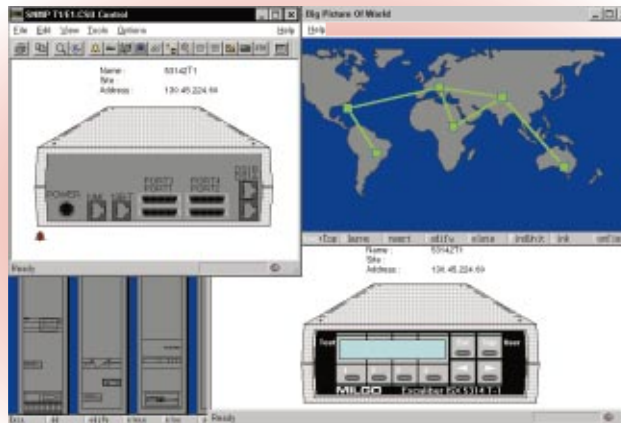
As a client/server implementation of network management, CMS 400 manages Milgo LAN/WAN technologies, including dial and leased-line modems, DSU/CSUs, multiplexers, ISDN terminal adapters, and switching and restoral elements. In addition, CMS 400 expands network control to TCP/IP devices using Simple Network Management Protocol (SNMP) to interact with any MIB-II compliant device, including extensions.

Architected for Interoperability

CMS 400, a DOS/Windows-based network management system, delivers backward compatibility for legacy products and migration support to new SNMP managed devices in a heterogeneous network.

Unique Servers Allow LAN/WAN Network Management

Milgo's CMS 802x network management servers deliver flexibility to LAN/WAN management. Units can be configured for PPP or Milgo's proprietary T7 diagnostic operation, allowing you to use your LAN to carry SNMP or T7 network management information to Milgo devices. Milgo offers two models:



CMS 400 provides device specific control, geographical maps, and color graphic images.

- CMS 8023 - supports Ethernet (10BaseT or 10Base2)
- CMS 8025 - supports Token Ring (UTP or STP)

Comprehensive Management

CMS 400 maintains complete configuration management of network elements by means of a common database. It has total fault management capabilities to monitor, control, detect, diagnose, and correct network problems. Its performance management features provide extensive line analysis, statistical trending, and specification testing abilities. Security management of access and system functions protect against unauthorized usage. Accounting management reports, generated from the collected network data, provide useful and important decision support information.

Easy to Learn

CMS 400 simplifies network management. This is achieved through a user-friendly interface of option-driven menu screens, windows, mouse and keyboard control, and Help text.

Sophisticated User Interface

Designed for maximum ease of use for those with skill levels from novice to expert, CMS 400 enhances overall productivity.

- Context-Sensitive Help not only provides operational information, but allows access to individual functions via Help menus. The Help feature contains a comprehensive index and uses hyperlinks to speed access to related topics.

- Command Line Recall improves productivity by reducing the keystrokes required for keyboard command invocation. The number of input errors is also reduced because of command reusability.

- Multiple Concurrent Function Windows improve the effectiveness of operation at all levels.

- Color Graphics highlight exceptional conditions and simplify the interpretation of test results and error messages.

- Network Management Functions can be selected easily from the pull-down, option-driven menus that hide functions not applicable for the selected object. Alternately, abbreviated command keywords can be entered from the PC keyboard to bypass the menu system.

- Easy-to-Read Input and Display Forms are provided with highlighted fields and valid options that can be easily selected.

- Alias command interpretation allows variable input recognition of commands.

Advanced Automation

Several significant productivity features assist in automatic handling of repetitive tasks, minimizing the number of operations necessary to manage today's large networks. In addition to reducing personnel requirements, these features improve system response time to events by automatically performing user-defined, preprogrammed task sequences.

- A powerful "script" file interpreter permits user-written procedures to deal with diverse operational situations. The interpreter supports syntax checking, conditional statements, parameter passing and named variables.
- A flexible scheduling system automatically initiates and performs functions, once or continuously, in response to alarm traffic or time of day.

Distributed Terminal Integration

The VT220 (subset) windowing capability of CMS 400 integrates many different types of equipment into the CMS 400 operator's screen. Devices that utilize an ASCII terminal can be operated from the CMS 400 workstation. PC communication and EDM ports can be connected to other network management systems that normally are driven by VT100/200/300 terminals. The VT220 Emulation opens a window to one of these ports to reduce terminal clutter in the command center.

Diverse Element Management Modules

The CMS 400's modular architecture offers several element management modules to select from. Based on your network configuration, you can have better integrated solutions that are easier to manage with more cost-effective control. One or all of the following element management modules can be managed from a single workstation:

- **Leased Access Manager** allows you to manage a hybrid network made up of leased access products. It provides features to monitor and control the Milgo T7 leased line and short-haul modems. Digital access products (such as DSU/CSUs) for DDS applications are also supported. In addition, voice and data TDMs and statistical multiplexers are managed.
- **Dial Access Manager** allows you to monitor and control all of your central and remote site Milgo dial modems. It provides features to manage V.34, V.32, V.32bis, and V.22 compatible dial modems. You can configure a unit, initiate dialing, display statistics, schedule tests, and generate reports.

- **LAN Internetworking Manager (LIM)** supports the industry-standard Simple Network Management Protocol (SNMP) as defined in MIB-II. It provides extensive management capabilities for MIB variables, which can be polled and graphed simultaneously as data is received from the devices. The MIB compiler makes the device's ASN.1 file accessible to CMS 400. The Custom SNMP Application Builder supports the creation of user-defined, SNMP-based applications into a convenient user display.
- **ISDN Access Manager** supports digital leased and dial-up products. Integrated Services Digital Network (ISDN) provides low-cost access to high bandwidth communications for a broad range of applications, from video conferencing with full motion video, to multi-megabyte graphical image file transfers.

SNMP Device-Specific Modules

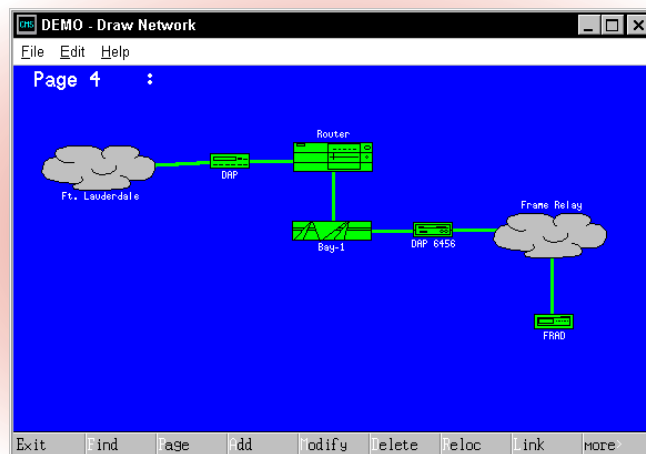
SNMP management modules are available to support several elements in the network. These software modules give you intuitive graphical access, and are designed to fully manage, configure, display, monitor and control SNMP-based devices. You can select from the following Milgo SNMP device-specific modules:

- **Excalibur® ISX 5300 Manager** for the ISX 5300 family of digital access multiplexers
- **Excalibur SNMP DAP Manager** for your Excalibur SNMP Digital Access Products (DAPs)
- **PremNet® Manager** for high-speed, broadband access backbone networks

Configuration Management

Through the use of a flexible object-oriented database, elements within the management module can be added, deleted, modified, or replicated.

- **Big Picture (Geographical Map)** allows you to monitor your entire worldwide network. Countries, regions, states, etc., can be configured as backdrops to the network topology. Scanned images can be added to show city streets or buildings. Icons for managed objects can be placed into the equipment rack view where they change colors to represent alarm conditions and reaction to point and click operations (Ping, Zoom, Monitor, etc.).
- **Auto-Learn/Discovery** provides the capability to learn the network by polling and identifying most manageable elements. Auto-Learn significantly simplifies data entry of network information.
- **CMS Component Map** provides management system-level information. It allows you to display and reconfigure system parameters and add, relocate, or delete diagnostic and operator ports.
- **Define Site** allows up to 32,000 site names and descriptions to be defined in form or free-text modes. Discovered units may then be associated with sites to improve administration and management.
- **Draw Network** graphical topology map gives you the capability to schematically draw the entire network, whether managed or not, with icons representing network elements. This option provides a detailed level of network interconnections, displays color-coded alarm conditions, and supports point and click operations.



Draw Network allows you to schematically diagram the entire network with icons and links.

Date	Time	Channel	Address	Alarm
11/05/96	12:04:55		130:54:243:1	PNET_SNMP Internal Event
11/05/96	12:05:21		130:54:243:1	PNET_SNMP Internal Event
11/05/96	12:05:53	PNET_I7	201	PNET_I7 Major
11/05/96	12:06:23		130:54:243:1	PNET_SNMP Internal Event
11/05/96	12:06:23		130:54:243:1	PNET_SNMP Internal Event
11/05/96	13:54:06	DAP_MP_LOU	4	MP_remote=4 Port Frame Lo
11/05/96	13:54:08	DAP_MP_LOU	4	MP_remote=4 Signal Quality
11/05/96	18:18:04	DAP_MP_LOU	4	MP_remote=4 Rx Channel Idl
11/05/96	21:58:49		130:45:240:210	ERRS Line Down/Up
11/05/96	22:02:58		130:45:240:210	ERRS Line Down
11/12/96	01:57:32	BRI2000	1	BRI2000 ISDN Svc. Fail
11/12/96	09:57:55		130:54:243:1	PNET_SNMP Internal Event
11/12/96	09:57:57		130:54:243:1	PNET_SNMP Internal Event
11/12/96	10:09:06	PNET_I7	201	PNET_I7 Major

At any time, a history of network alarms may be displayed. These can be quickly sorted by various criteria.

Intuitive Wizard Management

The Connection Wizard walks you through the connection process of your CMS 400 system. It simplifies the choices with a minimum number of prompts to get the necessary information, such as hub connections.

The Configuration Wizard is a dialog-based approach for incorporating devices into your network. Dialogs walk you through the device configuration process and provide access to all configurable items in the product. Configurables that do not need to be shown are hidden (for example: if a port is configured for synchronous, then configurables such as ALC, SLIP, and CSLIP are hidden because they do not apply to a synchronous interface). Wizards simplify the configuration of a device with a minimum of confusion.

Comprehensive Fault Management

CMS 400 delivers comprehensive fault management to support the detection and correction of abnormal conditions. Real-time notification, by means of unsolicited alarms and events, assures that timely corrective action can be taken. All alarms and events are logged to a file and can be sent to a log printer.

- **Fault Detection** supports a full complement of non-intrusive monitor functions available with each of its managed elements. Big Picture and Draw Network graphically display any alarms and traps on the network. All displays can be initiated from multiple (site, group, etc.) or single (unit level) element perspectives.

- **Fault Diagnosis** allows efficient isolation of failures to the network device. This is accomplished through intuitive line and device testing. Detailed statistics also help pinpoint intermittent or busy conditions that could lead to failures.

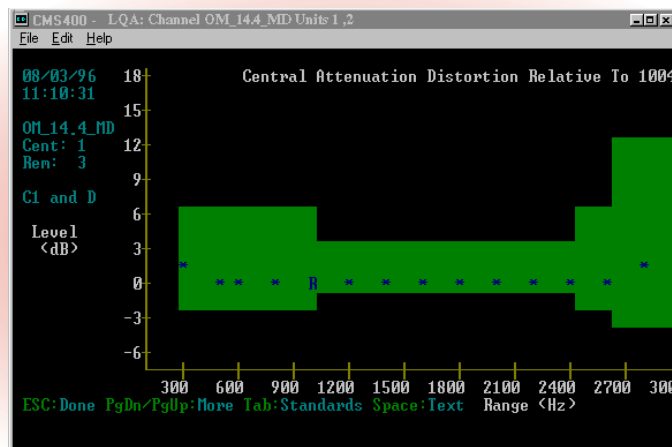
- **Fault Correction** provides prompt recovery of the communications link in case of a failure, which is a network user's chief concern. CMS 400 provides operator-driven or automatic restoration, using database-resident information to speed the process. Multiple-object initiation streamlines restoration by providing function initiation via convenient sets of units (e.g., groups). Alarm-driven restoration, combined with scripted command files, can automatically create an alternate communication path, using switching, redundant circuits, or dial backup.

Performance Management Reduces Downtime

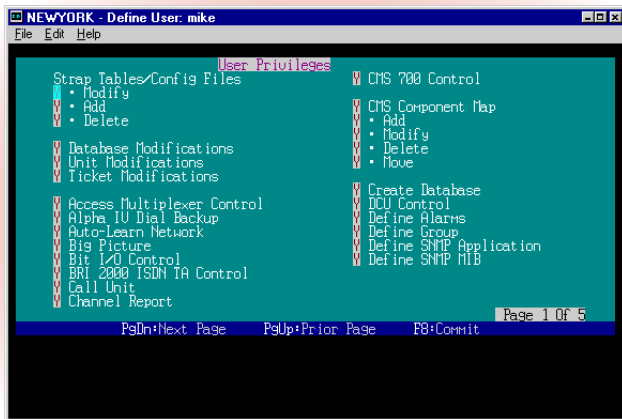
Monitoring the performance of the network and ensuring adherence to predefined operating limits is essential in alerting the network operator to impending faults.

CMS 400 warns the operator about degrading line conditions prior to circuit outage by reporting alarms and thresholds sent from the managed object.

Line Quality Statistics - collects and displays digital line statistics for network availability, signal, out-of-service codes, abnormal-station codes, receive line, network framing errors, unknown control codes, service loop not active, network resynchronization, and network resyncs per unit.



With the LQA option, you can test and display telephone line parameters as compared to Bell and CCITT standards.



Up to 64 users can be defined, each with a name, a password, and access privileges of over 50 individual functions.

Security Management

CMS 400 allows individual assignment of domain and access privileges for each authorized user. Password protection and partitioned network access ensure that only authorized users are logged on. Within a network partitioned by domains, the password access control feature allows over 50 individual functions to be assigned to each user.

Useful Reports

CMS 400 creates reports that give you a variety of information about the content and structure of the network. These reports include:

- **Network Equipment Reports** display all information to analyze the structure of devices set up in the network.
- **Site Reports** display all information at a particular site, such as unit address, channel, location, modem type, and unit status.
- **Topology Reports** show a graphic overview of unit addresses and channel names.
- **Event Log Reports** display information pertaining to specific event criteria, such as date and time range when the event occurred, event type and class, and the channel address and unit name where the event occurred. These reports can be used to show trends of when and where events occurred.
- **Channel Reports** display information pertaining to diagnostic channels including protocol, speed, port, status, and unit count.

- **Dial Statistics Reports** provide the capability to create reports based on the call-related events stored in a log. The following statistics are available:
 - Average characters per call
 - Maximum characters per call
 - Minimum characters per call
 - Average call duration (sec)
 - Maximum call duration (sec)
 - Minimum call duration (sec)
 - Average receive level
 - Maximum receive level
 - Minimum receive level
 - Average bits per second
 - Maximum bits per second
 - Minimum bits per second
 - Average cost per call (cents)
 - Average calls per minute
 - Average calls per hour
 - Total characters
 - Total originated calls
 - Total answered calls
 - Total successful calls
 - Total failed calls
 - Total online time (Sec)
 - Total cost (cents)
 - Most common disconnect cause

- % Utilization alone
- % Utilization in set
- Minimum % Utilization in set
- Maximum % Utilization in set

The dBASE III/IV formatting capabilities allow you to export the CMS 400 database into a dBASE III/IV-compatible ASCII delimited file. In this way, you can extend the reporting power of the system by using a wide range of commercially available programs, such as Microsoft Excel, A/T dBase, and Microsoft Access.

Trouble Ticket Plus

The optional Trouble Ticket Plus feature supports ticket generation directly from network alarms. You can also create tickets manually using keyboard and mouse.

Up to 5,000 tickets can be created before resequencing or when archiving compression is necessary. You can create custom ticket formats and fields to meet your individual data center requirements. Tickets can also be exported in dBASE III/IV format.

CMS[®] 400

technical specifications

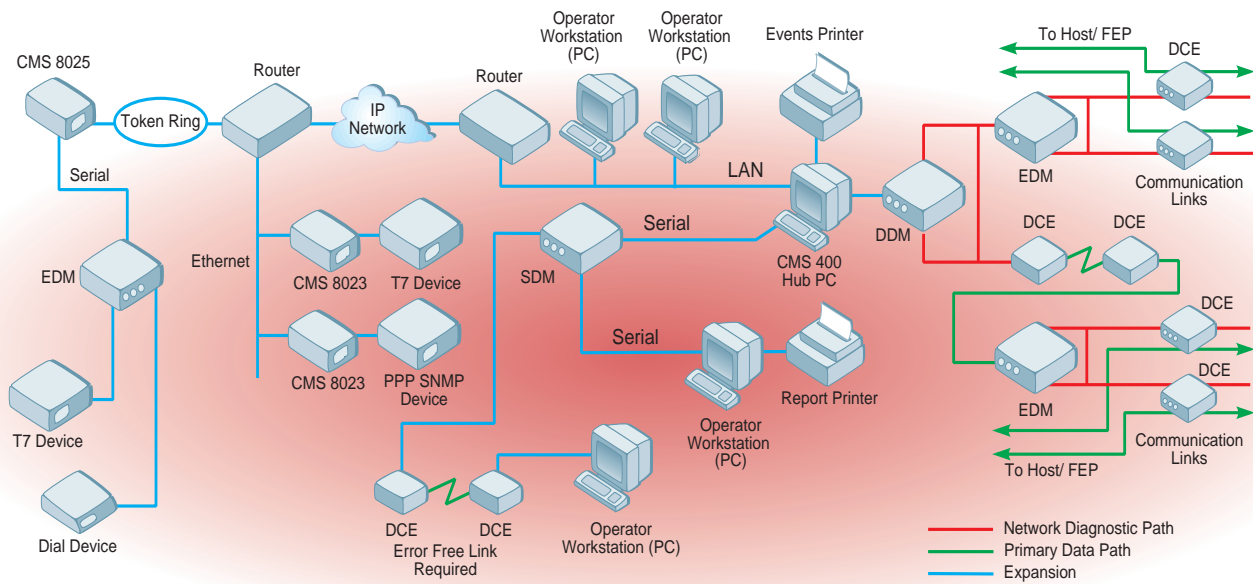
System Components	System size and configuration will vary based upon the size of the network supported and the number of users.			
Platform Requirements	Minimum PC hardware and operating system recommendations for CMS applications:			
	Function	Processor/Speed	Memory (RAM)	Hard Disk
DOS 6.22	Hub (only)	Pentium/133 MHz	8 MB	150 MB
Windows 95/98	Remoted Workstation	Pentium/166 MHz	32 MB	50 MB
	Combined Hub/Workstation	Pentium/166 MHz	32 MB	150 MB
Windows NT	Remoted Workstation	Pentium/166 MHz	32 MB	50 MB
	Combined Hub/Workstation	N/A	N/A	N/A
Interface Support	LAN interface – Supports Token-Ring or Ethernet using NetBIOS or TCP/IP (Recommended)			
	Serial Async interfaces as required			
Diagnostic Interface	Distributed Diagnostic Multiplexer (DDM) – Supports up to 16 EDMs on each DDM			
	External Diagnostic Multiplexer (EDM) – Supports up to 16 diagnostic channels			
	Station Distribution Multiplexer (SDM) – Supports up to 16 operator workstations			

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CMS 400 Typical Configuration

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