

Cerberus^â LMSmodular Basic Module Ver. 2.4

Product Description

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Document changes in Version 2.4

Topic	Comments
Complete integration in Windows 95/98	The Monitoring System software (LMS) starts directly from Windows 95/98
CerPass support	Full integration of the CerPass access control system into LMSmodular.
Page Browser	LMSmodular Page Browser can be run to navigate through the installation.
Extended Event list	Event list up to 999 entries. Automatic recovery from an overflow condition in the event lists during treatment.
System parameters	Improved system capacity for historic database

1 Introduction

This document provides a brief description of the characteristics and features of the LMSmodular software.

Its purpose is to give prospective customers and new users an overview of the comprehensive capabilities and features of this system.

LMSmodular is a management system for integrating security and safety systems. It allows central monitoring and control of security installations used in a variety of applications.

The LMSmodular system is presently installed in different versions in more than 1000 sites over the world.

Among the many benefits the user can get from adopting LMSmodular there are:

- the system flexibility - you can build the configuration best fitted to your actual plant. LMSmodular can be used for brand new installation as well as to improve the performances of existing system, integrating the already installed hardware.
- the software modularity - LMSmodular, as the name itself suggest, is composed by various modules. To start with, you buy just what you need, but you can upgrade the system when purchasing new modules as soon as your needs increase.
- a high reliability - LMSmodular is based on the concept of autonomous subsystems and distributed control. The decisions are taken at the lowest level possible and therefore actions are undertaken at the maximum speed. Moreover, a fault at higher levels does not affect the system capability to respond to events. To further reduce the risks associated to faults, redundant configurations can be implemented;
- the openness toward systems supplied by third parties. Using either the NISE00 or FHI Pads, or applying DDE solutions, the LMSmodular system can talk to systems designed and manufactured by others. You can therefore integrate into an LMSmodular plant technological devices or other security devices, provided that they comply with LMSmodular specifications.

1.1 For further information

You can refer to the following Cerberus documents to have information about specific products mentioned in this document. In these manuals you will find also information about how to install and/or configure software and hardware parts needed to properly set up your system.

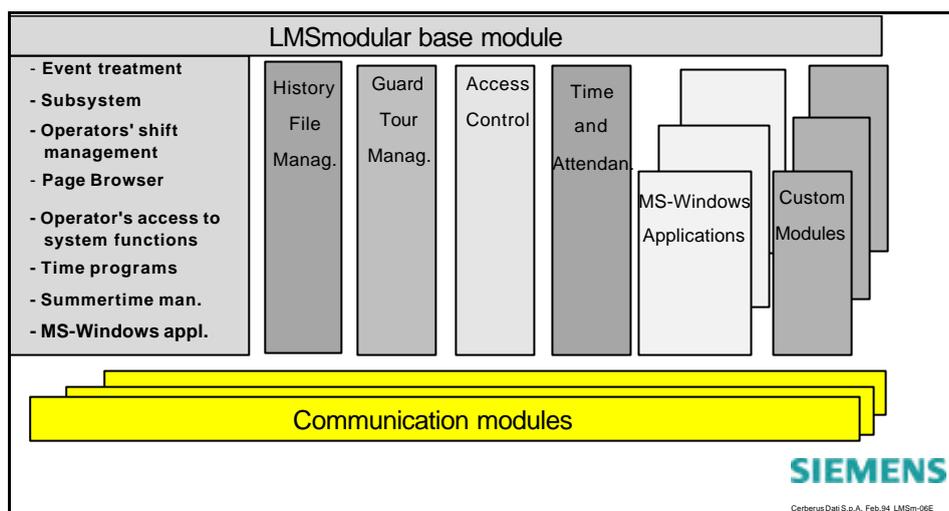
- | | |
|--------------------------------------|-------|
| ▪ GW-21 Technical Manual | e1481 |
| ▪ GW-20 Technical Manual | e1478 |
| ▪ LMSmodular Installation Manual | e1862 |
| ▪ LMSmodular User Manual | e1865 |
| ▪ LMSmodular Configuration Guide | e1863 |
| ▪ LMSmodular Configuration Reference | e1864 |
| ▪ NISE_CNF Configuration Manual | e1150 |
| ▪ FHI Pad Engineering Guidelines | e1143 |
| ▪ IMS2000 Engineering Guidelines | e1142 |
| ▪ LMSmodular System Description V2.4 | e1867 |
| ▪ LMSmodular Application Examples | e1868 |

2 General description

2.1 LMSmodular software architecture

The presentation software for LMSmodular has been developed entirely by Cerberus, explicitly for security applications. It is the standard product of the Cerberus Group throughout the world and has been so far tested in hundreds of installations. It is constantly up-dated and maintained in line with the evolution of the security requirements and of microcomputing environments and architectures.

The figure represents the software architecture of the LMSmodular package.



The package is built around a base module that provides the basic alarm handling and subsystem management functions, plus all the security functions required for this application. In particular the base module takes control of the Operating Station and will impede access to windows features, as for instance task switching with the alt-tab key combination, access to program manager and so on, in order to guarantee a secure and controlled operation.

Windows capability are left available under the control of the base module: for operators provided with the necessary access rights it will be for instance possible to start a standard pre-configured windows application, like MS-Word or Excel, still guaranteeing the priority of alarm treatment.

The base module communicates with the field devices via specific software modules, dedicated to different types of communication depending on the devices used at network level.

The base module manages its data base keeping the real-time process image constantly up-to-date on the basis of the messages it receives from the field via the communication modules.

The reason for the name LMSmodular is that the system allows for integration of additional software modules to realize specific functions. The historic file search and report utility, access control and guard tour are examples of functional modules and are described later.

LMSmodular base module has clearly defined and stable interfaces to external modules, so, following this architecture, further modules can be realized, even on a custom base, still maintaining the characteristic of LMSmodular to be a standard, repetitive and repeatable product.

Further modules can be for instance realized using standard off-the-shelf applications like for instance MS-Access or Excel, even without the intervention of Cerberus software developers. This can be for instance the case for customized searches and statistics on the historic file. The LMSmodular historic file is made available in a standard dB III format, so a specific application can be written using for instance MS-Access or Excel to generate custom reports, graphics and so on. In case of a LAN configuration, as described below, that application can be running on another station on the network.

2.2 Software module licence

The operating station running LMSmodular V2.4 software is enabled to actually communicate with the subsystems by the installation of the hardware key (of any release) and a Product Authorisation Key (PAK).

The hardware key must be connected to a parallel port of each operating station connected to the system. PAK is an alphanumeric string to be entered at installation time that contains two kinds of signatures that deal with:

- the operating station software modules the operating station can run
- the number of subsystems to be managed

2.2.1 Base software modules

LMSmodular is composed by a set of modules, that can be purchased separately. There are two kinds of *basic module*: the full and the reduced types. Moreover, you can purchase as *optional modules* the software packages to deal with Guard Tour or Access Control subsystem, or to manage a Graphic Station, each module being enabled by a separate option in the PAK. The two kinds of basic modules are:

- **Full module MS-01.** This license lets you access all the LMSmodular basic functions. Any function described in the “LMSmodular User manual” and that could be configured according to the instructions supplied in the “LMSmodular Configuration manual” is available on the operating station equipped with this license.
- **Reduced module MS-00.** This license restricts the access to some LMSmodular functions. Namely, the **subsystem management** and **historical archives management** functions are not available on the operating station equipped with this PAK. The operating station equipped with MS-00 PAK is called also secondary station. That name does not imply that the MS-00 station should be installed after that an MS-01 station has been already installed. In a plant you can have any mix of MS-00 and MS-01 stations. You can install for instance:
 - all MS-01 stations. You can manage the installed subsystems and work on the historical archives from any operating station.
 - all MS-00 stations. You can access all the LMSmodular functions but manage the installed subsystems and work on the historical archives. You can however manage the subsystems directly on their control panels and you can rely on the paper print out to trace events. The engineering solution of all MS-00 stations is however not common, because you lack some performances that LMSmodular could give you.
 - any mix between the two types of stations. This is the best compromise between cost reduction and high performances. The system manager operating station is usually of the MS-01 type, while the additional operator's stations are MS-00. From the MS-01 station you have full control of all system functions while on the others you perform routine monitoring tasks.

2.2.2 Optional software modules

The optional software modules provide access to the Guard Tour and Access Control subsystems (CerPass and Westinghouse). There is also an optional module that lets you connect a Graphic Station to the Operating Station.

Guard Tour

The Guard Tour is a virtual subsystem, i.e. it is not composed by physical devices. It simply collects signals generated in specific places at preset times by an operator that makes the tour. The Guard Tour is intended to compel the watchmen to physically inspect various places of the building they must attend to. The software module manages both the configuration and the use of the Guard Tour, and it is of course fully integrated in the LMSmodular environment. The module manages the physical devices associated to the tour, interacts with the intrusion detection system that must be temporarily disabled to let the watchman enter the protected area, starts at preset or random times the tour and eventually generates and manages the associated events. Guard Tour is enabled by a specific option in license PAK.

Access Control

An Access Control system is designed to allow particular people entering a secured area and keeping everyone else out. The LMSmodular Access Control lets you track the users inside the building, reports the date and time of boundary crossing, monitors anomalous conditions (such as doors forced open or open for too long) and interacts with other security and safety subsystems to keep the site secure and safe. It can accommodate thousands of people, each with his or her own access times and allowable doors. It can also monitor almost any kind of electrical sensing device and take appropriate action when conditions change. It can as well provide a detailed report, on paper and/or on disk, of any action it senses or takes. The LMSmodular Access Control package lets you manage the hardware devices installed and to define who can enter and who must stay outside the controlled site. You are presented with an easy-to-use interface in the Windows environment to configure the whole Access Control system. The software module is enabled by a specific option in license PAK.

Two Access Control systems are supported: CerPass and Westinghouse.

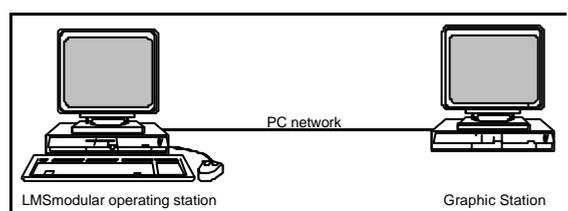
Graphic Station

The Graphic Station is an output device designed to work in conjunction with LMSmodular, the centralized monitoring system by Cerberus Dati.

The Graphic Station displays graphic maps when an event occurs, and by doing so it eases the operator's task to recognize the event and to perform the required actions.

A Graphic Station is a PC connected by a local network to the LMS operating station and running the Graphic Station program in the Windows environment. The local network hardware could be any among those that are fully Windows compatible.

When the operator treats an event or manages a subsystem, the Graphic Station displays the map configured for that event. The local network is the physical link between the two PCs and it is managed by Windows network services



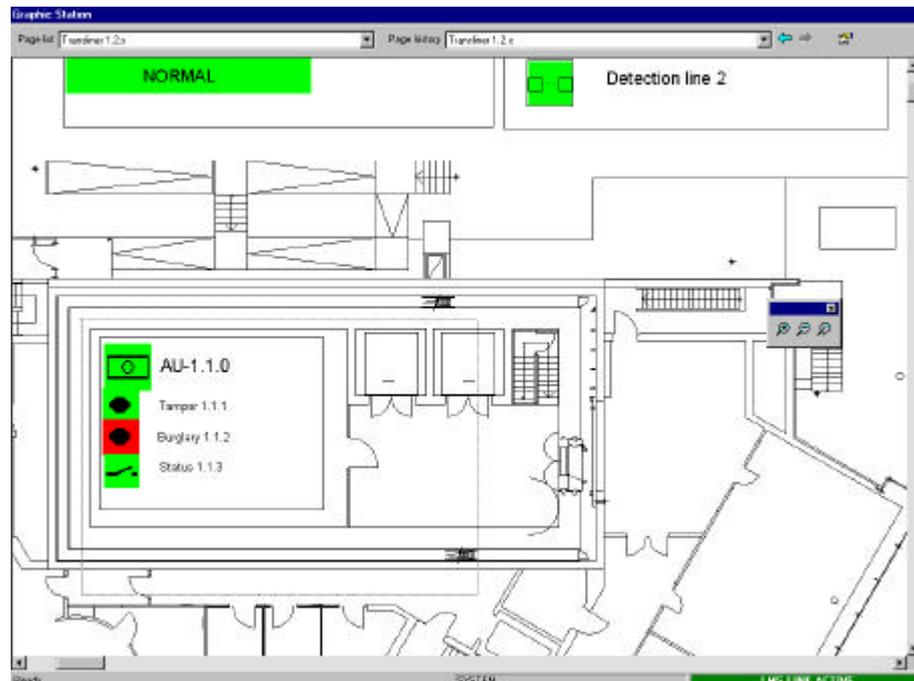
When there is no operator active on the LMSmodular Operating Station, the Graphic Station shows an introductory map. This map could be used to display a logo, or a general representation of the controlled site.

When the operator treats an event, the map related to the event/point is shown. For each point status, up to five pages can be configured. The fifth page is the map to be displayed when that status for that point occurs.

During subsystem management, the Graphic Station displays the map configured for the subsystem.

Graphic station is supported in two different versions:

- Graphic Station standard (or shortly LMS-GS), supporting graphic maps at VGA resolution, the same as LMS Operating Station
- Cerberus Graphic Station (or shortly LMS-CGS) supporting higher resolutions, map zooming and panning, import of Autocad drawings.



LMS_CGS user interface

2.2.3 Number of lines

The PAK contains also the information about the number of subsystems you can connect to the operating station. Each subsystem counts in general one unit. Exceptions are CMX/CF9003, CC-30 CerPass, Westinghouse SExxx and equipment connected via NISE and FHI-PAD.

- Each CMX/CF9003 cluster, ranging from 1 to 16 units, is equal to one subsystem.
- SE902/422/818/4100 NexSentry are not considered in the count, i.e. they do not weight any subsystem.
- CC-30 CerPass are not considered in the count, i.e. they do not weight any subsystem.
- A connection to Staefa Control System MS-2000 via NISE-PAD or to Foreign System via FHI-PAD counts for one subsystem.
- Gateways (GWxx) and other interface devices (MK-7022, CK4, CK11, MF-7033) do not count at all.

You can actually connect and configure more subsystems than available in the PAK. In that case you will be able to see only the subsystems with the lowest local address, up to the number of subsystems allowed by the license.

Moreover, the out-of-scan subsystems are not considered for the license maximum limit. If you purchased a license for 4 subsystems and you have installed 5 of them, you can put one of the subsystems out of scan in the database and use LMSmodular to monitor the other 4.

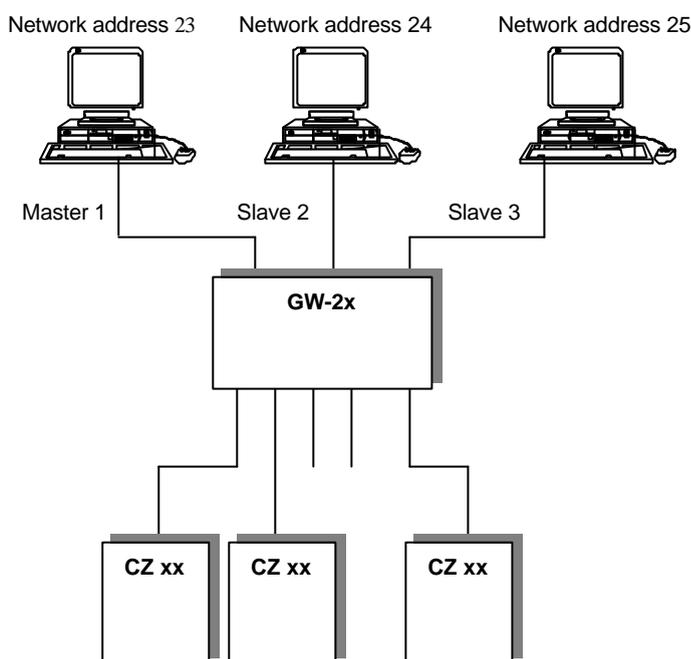
2.3 Master/slave stations

LMS can operate in a multistation environment - i.e. more than one station can be used to monitor simultaneously the same field devices.

By this way you can for instance separate the management of different systems (e.g. fire and intrusion detection) on two different operating stations in front of which sit operators with different skills.

An other possible use of the multistation architecture is in redundant configuration, in which one PC acts as a backup to the other. The multistation configuration is fully compatible with the hot stand by configuration, in order to get a full redundant system.

The multistation architecture applies both to two and one level networks, i.e. to networks with a gateway acting as a concentrator or network with a gateway to which the control units are directly connected. In both cases, the PCs have to be connected to the highest level gateway. It works also in a configuration with multiple gateways.



In the multistation environment, a station has a peculiar role among the others. It is the master station, that must be connected to the whole system. It sends the date and time to the gateway(s) and to other stations. The other stations are slaves. They cannot synchronize the system, i.e. they cannot send date and time to the other devices installed.

Some stations are partial master - they acts as a master if the initial master fails, but they are connected only to a part of the system.

In a multiple gateway configuration, all the operating stations must be cross-referenced, i.e. they must be configured in order to receive and send information to any other station.

The operating stations work autonomously but each one is informed about the healthy status of the other, and is able to display information and events about them.

2.4 User interface

The operating prompts of LMSmodular conforms largely to the syntax of standard Windows applications. For the sake of greater clarity and reliable operator response, particularly in stress situations, the individual objects and messages are always displayed in fixed areas of the screen.

The screenshot shows a complex user interface for fire prevention monitoring. At the top, there are status indicators for 'S. ALARMS' (3) and 'FAULTS' (1). A digital display shows the time '11:49' and the word 'SYSTEM'. Below this is a header section with 'F1', a date '28/OCT/96', 'Agency n.1', 'Fire prevention', and 'Cerberus Algorex' with a technical address 'M:0099 01:001:006:000'. The main area is a table of events with columns for date, time, location, and status. A filter bar is at the top of the table. At the bottom, there are buttons for 'Access operator functions', 'Events 4: 4', and 'Master 1'.

There could be five lamps, with different colours, like this. They show the type and the number of events currently present in the system

The Cerberus Logo is also a button that supplies you with information about your LMS modular installation

This button is used to access the treatment pages to process an event

This button shows the code of the operator currently logged in. It lets you also access the operator-oriented actions: logout, switchover and password change

This digital display shows the current system time. It acts also as a button that lets you change the date and the time

This button gives you access to the system functions compatible with your access level

Technical address of item

Reset the filter that is currently active on the list

This part of the screen supplies information about the type of list you are currently looking at

Here is shown the information about the most relevant event

The work area usually contains the list of events, but it is used also to display dialog boxes, video pages and commands during normal system operation

Workstation number

Here you get information about the type of workstation you are working on. It could be Master, Slave or Partially Master

The content of this field varies according to the information displayed in the work area:

- if it is LIST (as in this example) the first number is the number of events shown, the second the total number of events;
- if it is SUBSYSTEM MANAGEMENT, it shows the number of points in the view;
- if it is TREATMENT, the first number is the number of the current page displayed, the second is the number of pages associated to the event

In the upper area of the screen the alarm counters are displayed into "event lamps". These show the type and number of pending event messages. The flashing background color of the alarm counter signals that unacknowledged messages of the corresponding event type are pending. LMS differentiates 5 different event types. For the sake of clarity a different color is assigned to each event type:

Red = Severe Alarms; normally alarm events from fire detection systems and intrusion detection systems are displayed here.

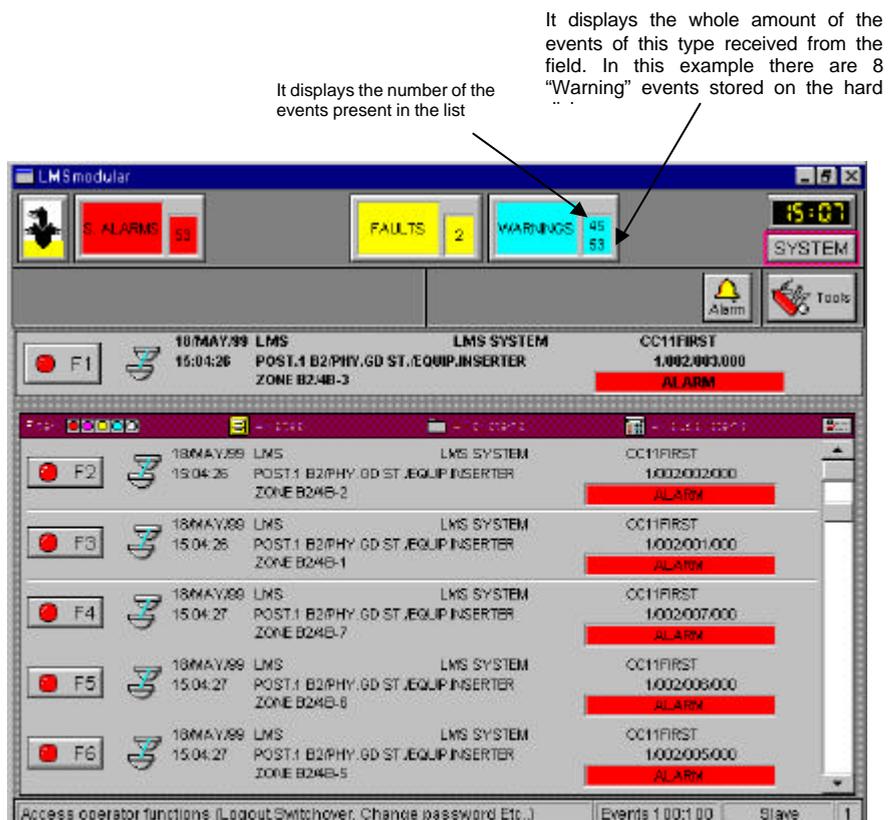
Magenta = Alarms; these events are used for indicating sabotage messages.

Yellow = Faults; the event type FAULT includes all messages related to technical malfunctions of the subsystems and the LMS itself. But also faults within the communications network and the workstations such as printer out of paper, etc. are signaled.

Light blue = Warnings; this message category is used for displaying system internal events, for example an overflowing history file. Warnings can also be programmed explicitly to prompt the user to perform specific steps at certain times. For example a recurring monthly prompt to change his password.

White = Anomalies; abnormal conditions are system states that deviate from the normal operating state, for example fire cuts switched off, or open doors, etc.

Events exceeding the maximum value are not shown in the events list, but they are stored on the hard disk. In this case the "event windows" show the number of the events displayed on the list and the whole amount of the events resulting from the sum between the events displayed and the ones stored on the hard disk (see the picture below).



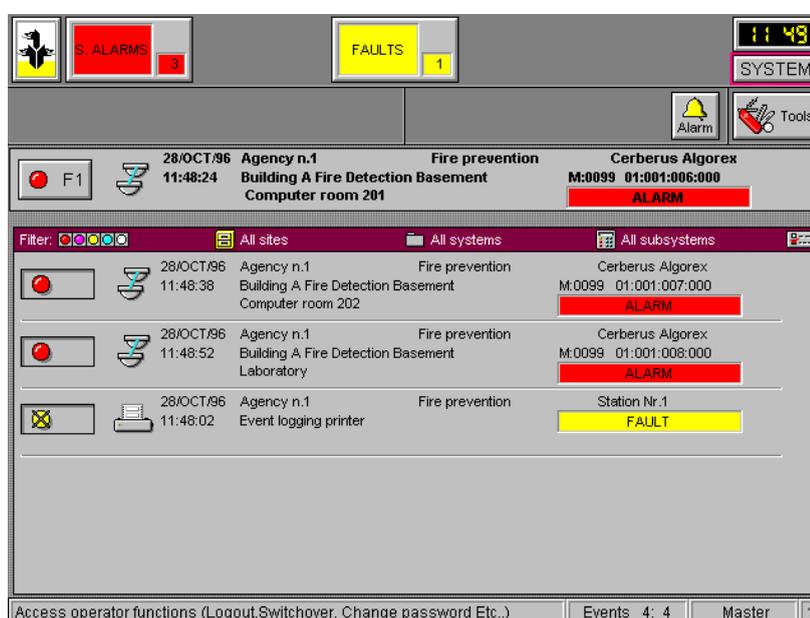
3 Base module functions

This section describes the functions that LMSmodular makes available.

3.1 Display and processing of events

When an incoming telegram triggers an event, various system activities are initiated:

1. A message is displayed on the screen. On the left of the event message a command button for selecting this event for processing is displayed.
2. The corresponding event counter is increment by one and starts to flash
3. On the top right, next to the tools button, a flashing bell symbol is displayed and the internal buzzer starts to beep



This procedure is repeated for each newly occurring event. If several events are pending simultaneously, they are sorted based on their priority and displayed in the event list. The event with the highest priority is displayed first in a separate field.

The event priority is based on the following 3 criteria with descending weight:

4. Unacknowledged messages
5. Event type (Priority 1 alarm, alarm, fault, abnormal condition)
6. Event time (the oldest event has the highest priority)

Up to 6 events can be displayed simultaneously (may be less if special options are set). If additional events are pending, a scrollbar button is displayed on the right-hand side of the work area. The list can be scrolled forward and backward by clicking on the scrollbar button.

To obtain greater clarity if many messages are pending, various filters can be activated via the "Tools / List" menu. These filters have the effect that only messages of a specific type or messages of specific subsystems are displayed. The alarm counters are not influenced by these filters so that the total number of pending messages can always be ascertained.

The filters for the various event types can also be activated directly by clicking on the corresponding alarm counter.

3.1.1 Event message

An event message comprises the following components:

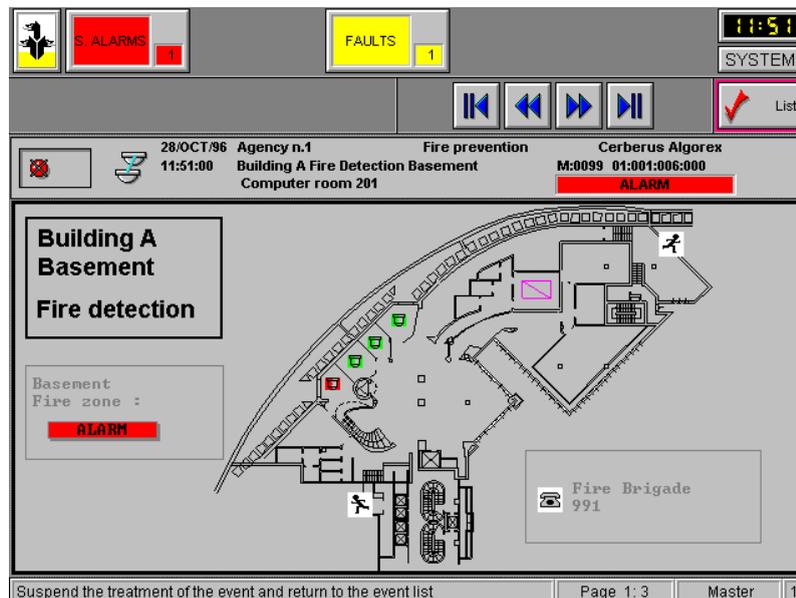
1. Icons for identifying the nature of the event
2. Time and date of the event
3. Logical structure with a description of the site, system and subsystem in which the event occurred (optional, it can be configured)
4. Description of the data point (automatically imported from CS-11, STT-11, CS-40 and CS-6)
5. Current status of the data point in plain text
6. Button to select the event for process it

Normally the event with the highest priority is processed first. Before an event can be processed it must be selected from the list by clicking on the command button at the left of the event to be selected. Another selection method is to press the corresponding function key on the keyboard.

The behavior of LMS at this point is influenced by the software options configured. By default, the selection of an event automatically initiates an acknowledgment command for the corresponding subsystem.

3.1.2 Treatment pages

When an event was selected to be processed by clicking on the command button at the left of the event or by pressing the corresponding function key on the keyboard, the treatment pages are shown.



The selected event is displayed in the place of the one with the highest priority, and in the event list area the first of up to 5 so-called treatment pages is displayed (if configured). If the Graphic Station is installed, the first four pages are displayed on the LMS-OS, the fifth is a map to be displayed on the Graphic Station.

Treatment pages provide detailed graphic and symbolic information on the location and nature of the event.

In addition to the geometric structures, for example plan views of buildings or diagrams, also the states of individual data points can be displayed graphically or alphanumerically.

It is also possible to assign individual commands or command sequences to the treatment pages. These commands are activated by clicking on the corresponding command button. In the most simple case a page also contains an instruction to the user on what steps he must take to cope with the event, for example a list of persons to be alerted.

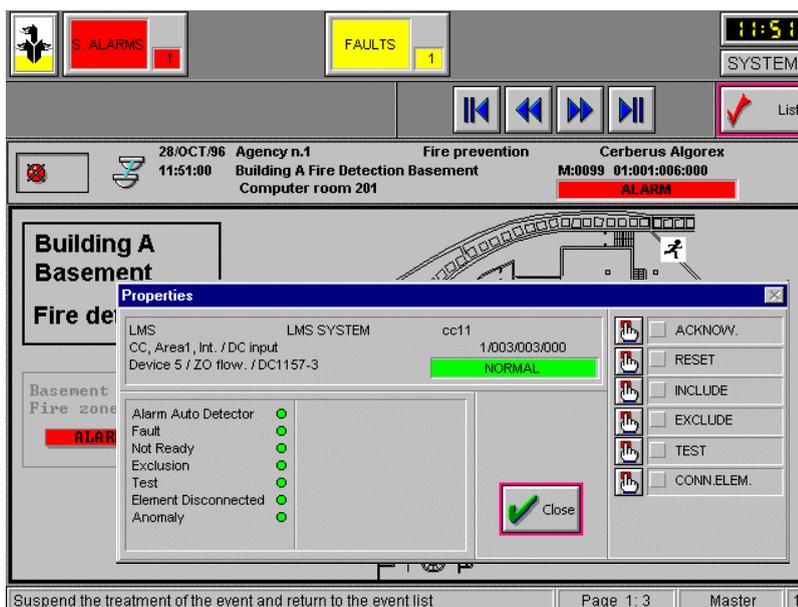
Thanks to the powerful capabilities of LMSmodular also real-time video pictures can be inserted into the page. In this way the operator is able to follow the action at the site without leaving his station.

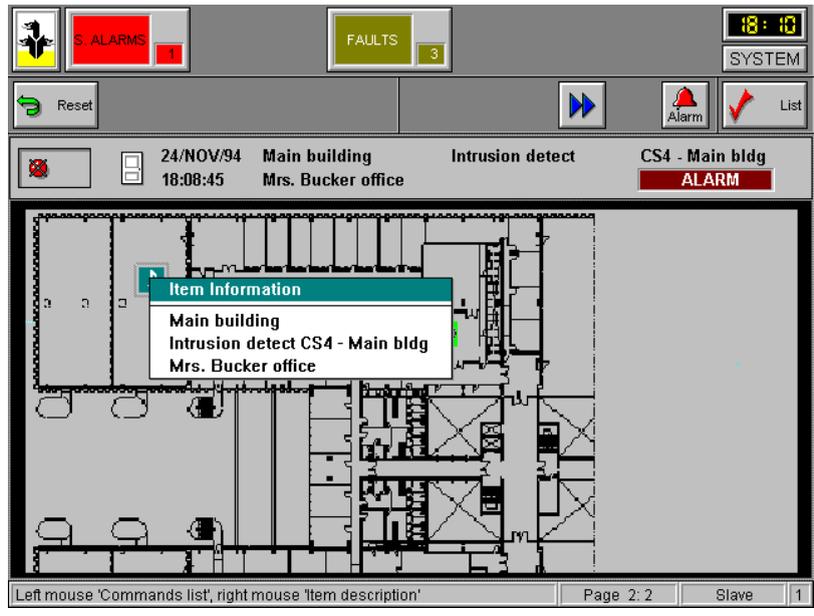
If several treatment pages are available for a given event, these can be called successively by clicking on the corresponding command buttons. On completion of the processing the event is normally reset. If this is not possible the operator can return to the list and treat other events.

The graphic pages that can be displayed during event treatment or subsystem management let you access to command menus and information about the foreground points.

To access the commands for a specific subsystem when you are in the treatment page, you must click with the mouse on a point displayed belonging to it. A command pop-up menu will be displayed. The menu content can vary according to the point and subsystem you selected.

To send the command, click on the corresponding button. A check mark will be displayed in the checkbox on the right of the button. Some commands available in the pop up menu let you set the subsystem status in the same way you could do in the subsystem management. For instance, there could be button available to set the subsystem in the night/day organization.





When you are in a treatment page you can also display information about each point shown on the page by simply pointing with the mouse to the target and pressing the mouse right button. A dialog box listing the point system, subsystem and description will be shown.

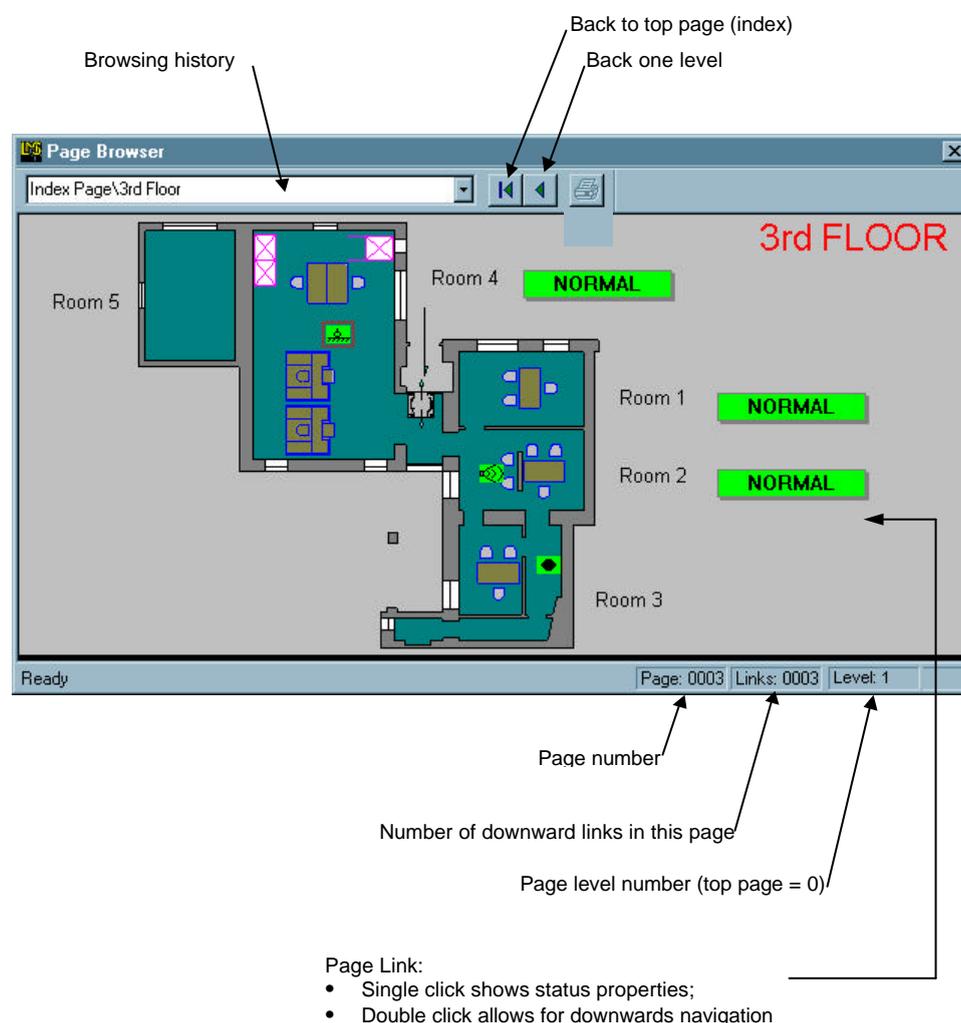
3.2 Page Browser

The LMSmodular page browser allows operators to navigate around their installations starting from the top geographic objects (the building, the complex, the region etc.) down to the lowest level (typically the room).

The lowest level pages generally displays dynamic symbols representing detectors or zones etc. Each higher level (parent) page contains data points that not only point to the child pages but also summarize the information from those pages. The color of the summary point indicates the highest priority event from the corresponding child page; while clicking on this symbol with the mouse, displays a property list which provides the operator with more detailed information.

A summary of the entire installation is presented at the uppermost level.

The Page Browser provides for an effective solution for a full-graphic system management and control. Events are summarised on top-view graphic maps and detailed analysis and control are possible with subsequent zooming steps.



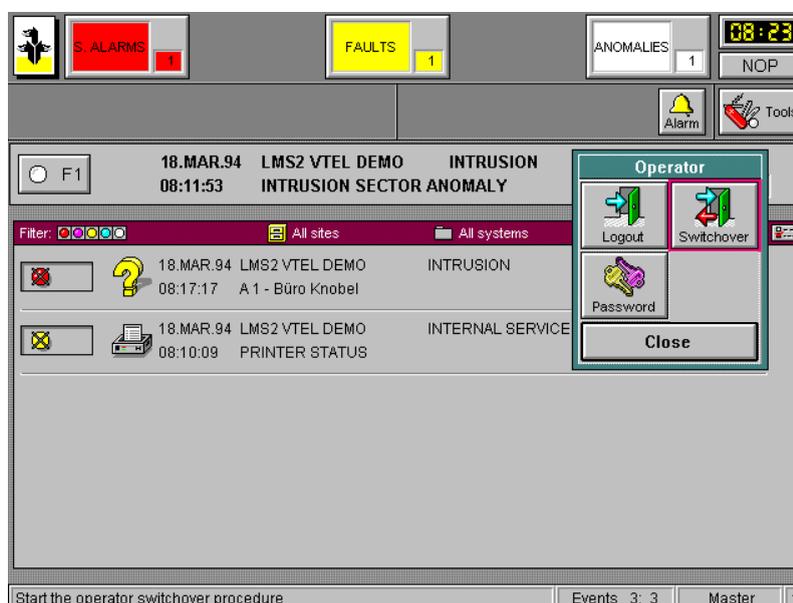
3.3 System access

Almost all information, displays and operator functions of the connected subsystems are also available on the LMS PC. Some of these relate to security functions such as switching off a fire cut. Since these functions should not be accessible to all operators, LMS features certain protection mechanisms through which the actions and displays can be restricted to specially authorized persons.

The protection mechanism is based on a concept of 10 hierarchical security levels (0..9) and 10 corresponding access levels. If a function, a subsystem or a special display is assigned to a specific security level, only the operators with a matching or higher authorization privilege are granted access to that function.

Before the system enables the access privileges, the corresponding user must sign on by entering his operator code and password.

The code of the current operator is continually displayed in a field below the system time. When this operator code is clicked on, a dialog window is opened. The buttons inside it could be used for signing the operator on or off or for changing the password.



3.3.1 Login

This command is executed after the system starts or after a LOGOUT. The operator must enter an operator code (max. 6 characters) and his password. The system then enables the functions that correspond to the access privileges of this operator.

3.3.2 Logout

With this command the operator signs himself off the system. For security reasons the operator must enter his password also for this operation. The functions and displays that remain accessible after this command, e.g. event printing and display, can be defined within broad limits.

A special case is the "NOP" (no operator) mode. When this mode is configured the system is instructed to automatically sign on a virtual operator with the access authorization level 0 after "LOGOUT" has occurred. In this mode all functions and displays assigned to security level 0 are accessible.

3.3.3 Switchover

This command is a combination of the preceding commands. It is used whenever the system is handed over directly to a different operator, e.g. during a guard shift change. The operator signing off must enter his password, and the operator signing on must enter both his user code and his password.

3.3.4 Password

When this function is called the operator who is currently signed on can change his own password.

The passwords and operator codes are stored in ciphered format.

The security levels and access authorization levels are defined off-line through the configuration tool "COPAVI":

a) Definition of the operators

For each operator an operator code, one or two passwords and an access level must be defined. Access level is compared with the security levels of LMSmodular items (see point (b) below). If desired additional information such as the address and telephone number must be entered.

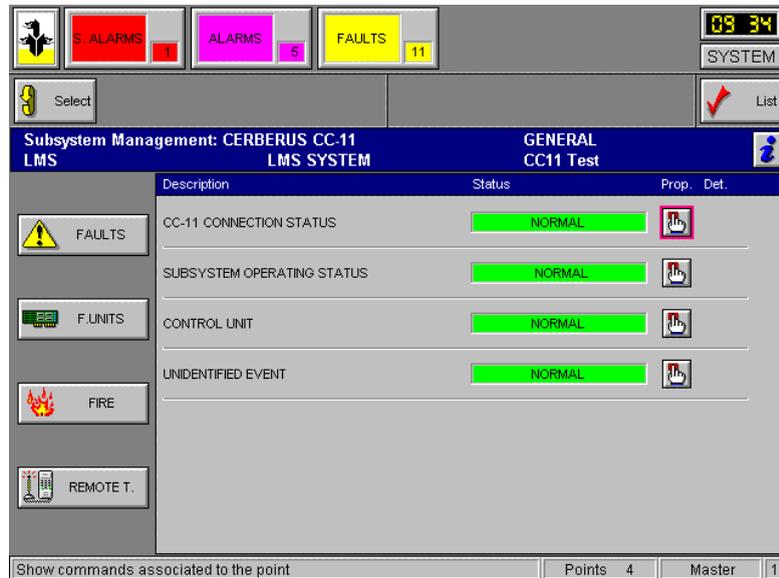
b) Definition of the security levels

Security levels can be defined independently of each other for the following functions:

1. For the individual menu items
2. Subsystems
3. User-defined commands or sequences

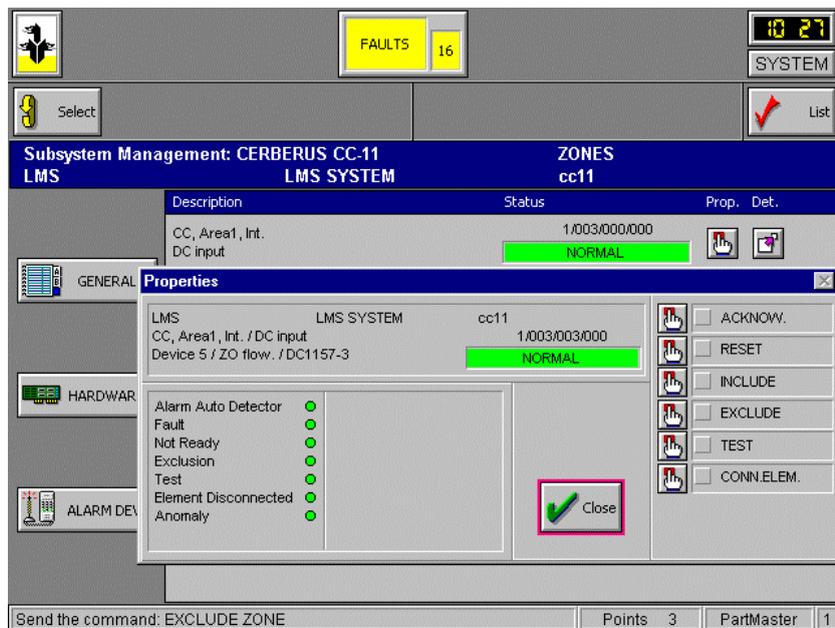
3.4 Subsystem management and control functions

In addition to the processing functions for both events and alarms, the LMS also contains comprehensive control functions. For each subsystem LMS provides so-called Management Pages. These can be recalled with the TOOL menu. They normally contain all control commands and functions that can be retrieved via the network.



Through LMS it is possible to switch the organization of a system control unit from DAY to NIGHT mode.

The control commands assigned to the data points can be activated with the mouse.



3.5 System time

The system time is supplied by the internal clock of the LMS station, i.e. the system clock of the personal computer. All operations and events are stamped with this time information.

In addition the clocks of all connected subsystems, including the gateways, are synchronized every hour.

LMS supports automatic changeover from summer to winter time and vice versa.

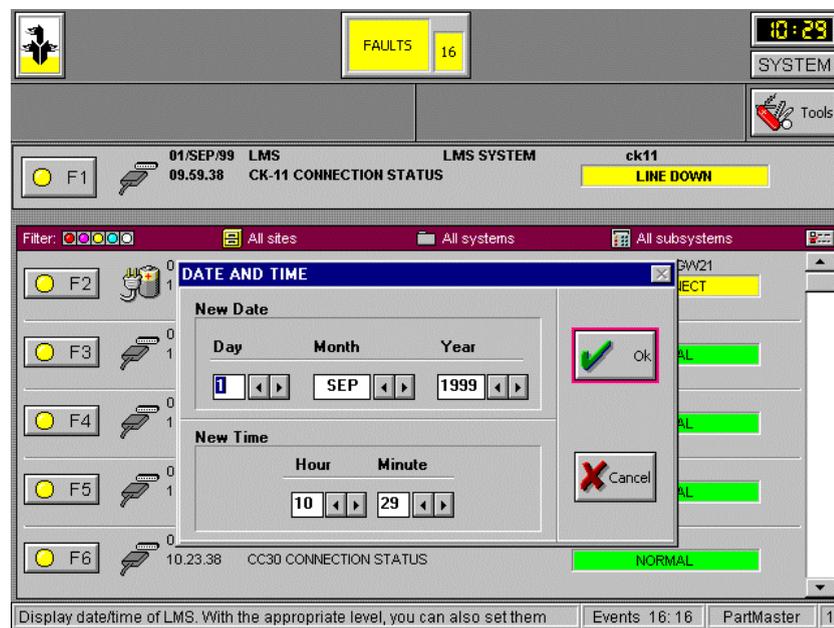
Three different changeover modes are available:

7. Automatic changeover based on the International standard (i.e. last Sunday of March and last Sunday of October at 2 a.m.)

8. Manual changeover based on preprogrammed values

9. No automatic changeover.

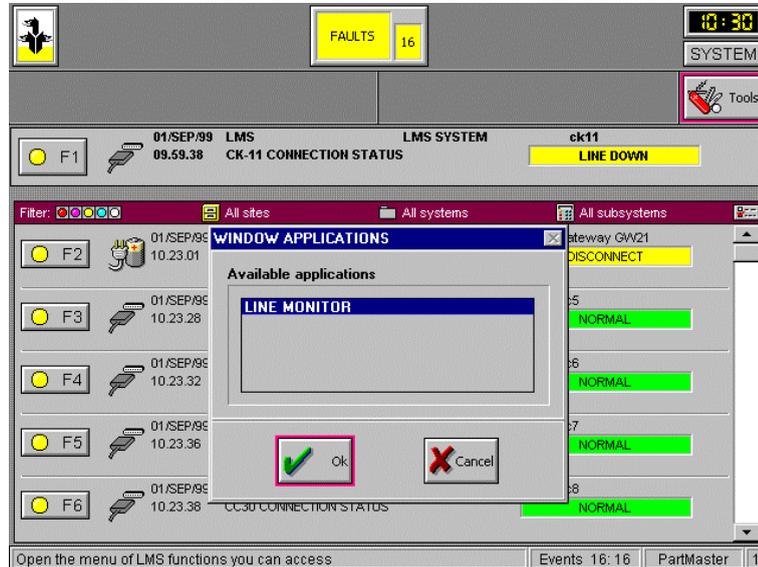
It should be noted that the manual changeover based on preprogrammed values must be redefined each year.



The momentary system time is continually displayed in the upper right corner of the screen. With corresponding access privilege the operator can open a dialog box by clicking on the clock so that the time can be set.

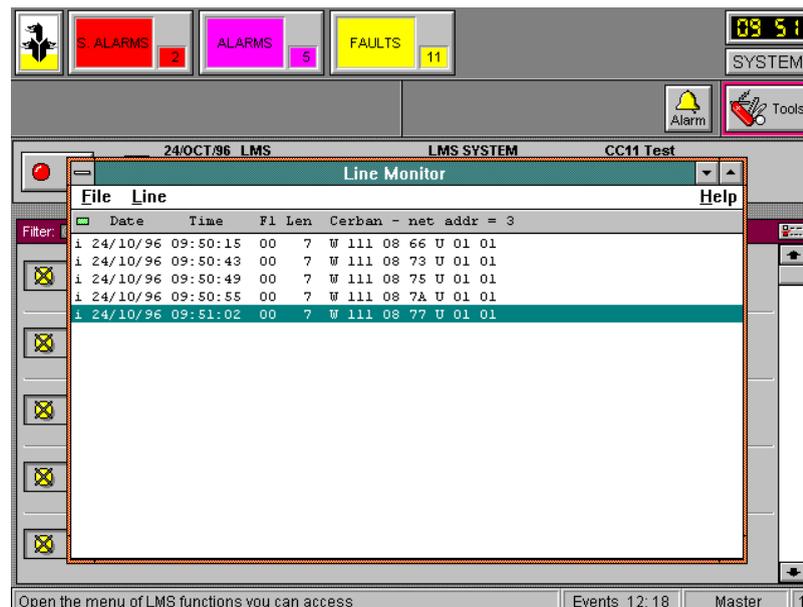
3.6 Applications

One of the significant capabilities of Windows is that several applications can be run simultaneously. Subject to certain restrictions this is also possible with LMS modular. Of course, security related applications are of principal interest such as control programs for CCTV, access control, etc.



To ensure that new alarms and events are displayed immediately, LMSmodular assumes certain control functions of the program manager. This means that only one additional Windows application at the time can be started and that this application can use only the lower part (LMS working area) of the screen. In this way the event counters of LMSmodular remain visible at all times.

Windows applications can be started via the Tool menu. After "WIN Appls" has been chosen a dialog box is displayed from which an application that is compatible with LMS can be selected.



Application programs must first be installed by the system supervisor and be assigned to a security level. This means that the individual programs can only be started by operators who have the corresponding access privilege.

3.7 Sequences

Sequences are program instruction sets, comparable to macros in certain application programs. They are used for application specific control of the subsystems connected to LMSmodular. With the available instructions it is possible to build programs that transmit commands to the subsystems, and check or change the status of data points. In addition the instruction repertoire includes instructions for programming conditional branches and calls to other sequences. They can be activated by so-called time-controlled programs, or be activated manually from a treatment page.

3.8 Time programs

Time-controlled programs are procedures that call one or several sequences either on a one-time basis or recurrently at certain times. The time-controlled program is driven by the calendar function.

The individual time-controlled programs contain up to 16 entries. Each entry specifies the starting time, the sequence to be executed, and optionally the run-time parameters to be transferred to the sequence.

3.9 Warnings

Warnings are used to supply one-time or recurring instructions to the user such as a monthly prompt to change his password.

With respect to their time behavior warnings can be compared with the time-controlled programs. These activate virtual event messages rather than sequences. The operator processes these warnings like normal event messages (acknowledgment/reset)

Treatment pages can be assigned also to these event messages.

3.10 Calendar function

The calendar function is the basis for Time-controlled programs and warnings. This function can be used for defining various types of days such as working days, holidays, vacation, etc. It causes the system to execute certain Time-controlled programs and warnings only on specific days. For example a time-controlled program can be created that controls the alarm organization of the connected fire detection system control units daily, but only on working days.

4 Historical data module

All events such as subsystem status changes and operating sequences on the LMS itself are stored chronologically on the hard disk of the LMS station. Whether a special event is to be recorded or not can be defined within broad limits.

The screenshot shows a software interface for historical data management. At the top, there are status indicators for 'FAULTS' (1), 'ANOMALIES' (1), and a digital clock showing '08:31'. Below this, there are buttons for 'Confirm', 'Cancel', 'Backup', 'Restore', and 'Info'. The main area is divided into several sections: 'File' (On Line / Off Line), 'Period' (Unlimited, Today, Yesterday, Last Night, Range), 'Record Type' (All, Field Events, Operator Actions), 'Source' (Site, System, Subsystem), and 'Operator' (All, List, Other). A 'LAST SEARCH PARAMETERS' table is visible at the bottom of the search criteria section.

File	Period	Record Type	Operator	Site	System	Subsystem
On	11/FEB/1994 00:00	Field		LMS2	All	All
Line	11/FEB/1994 15:15	Events		VTEL DEMO	Systems	Subsystems

Historic file management

Through the history function the data can be retrieved ON LINE on the LMS station and the history file can be printed out selectively or completely.

Through the search function of the history data management specific events or an operator action can be located.

For long-term storage of the data a backup of the history file can be created on a diskette. For reviewing historical data the backup files can be reloaded into the system without overwriting the current data on the hard disk.

The following record search criteria are available.

Time period

Unlimited / Today / Yesterday / Last Night / Range (as specified by the operator)

Event

All / events / operator activities

Operator

All / individual operator

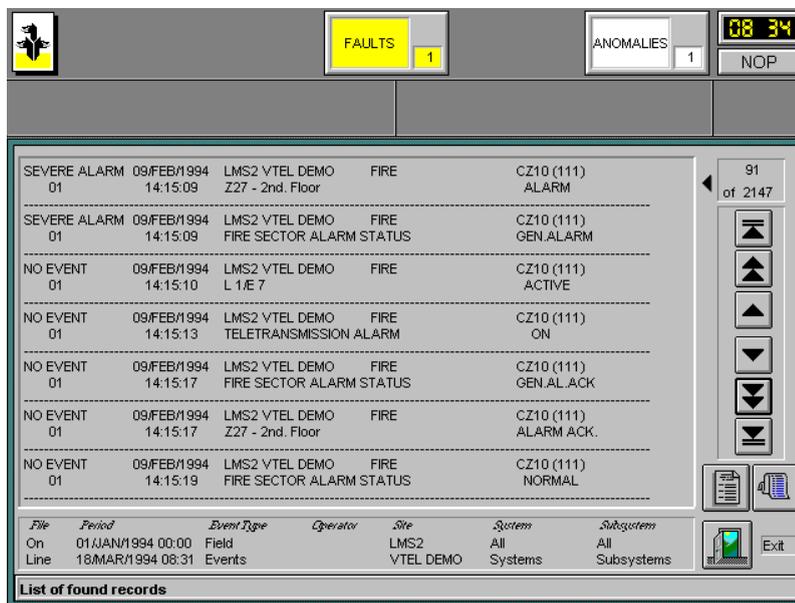
Source

Site / system / subsystem (Optionally ALL or a selected range can be entered for any of these)

File

ON LINE / BACKUP

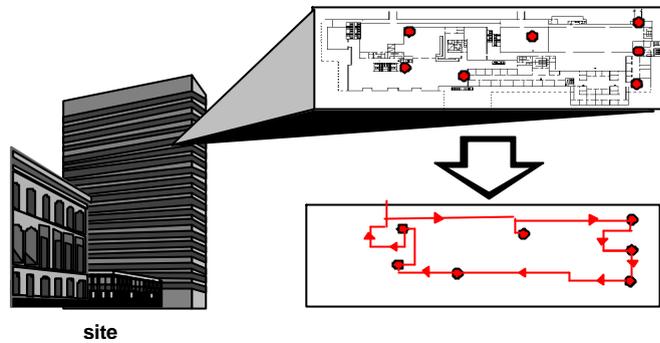
On completion of the search operation the history records that match the search criteria are displayed. If a comment was entered at the time an event was reset, this comment can be displayed by clicking on the symbol next to the corresponding event. Either all entries found by the system or selected pages can be printed. If desired these print files can also be stored on disk.



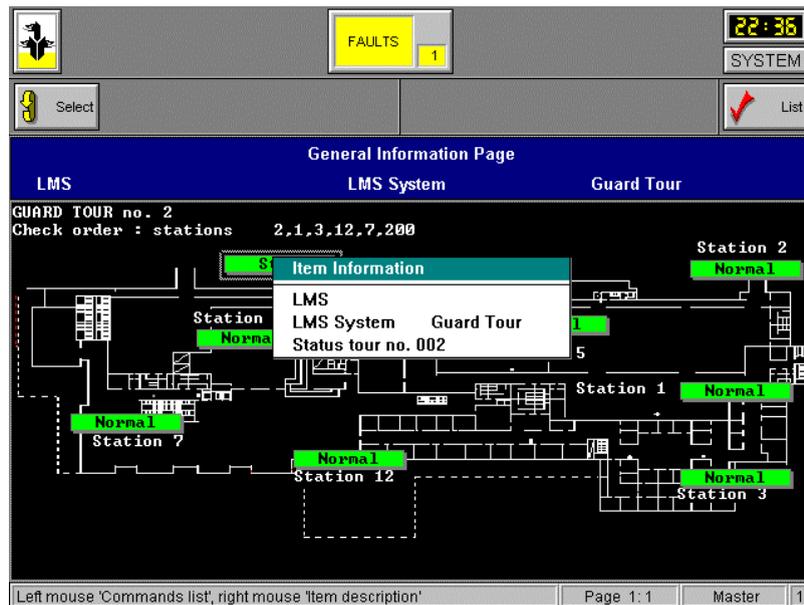
For storing the history data the LMS creates a file of a predefined size on the hard disk. When the end of this file is reached the oldest entries are overwritten. LMS automatically generates a warning before old entries are overwritten. If the history data must be preserved, the operator can create a backup on diskette by clicking on a corresponding command button. After the backup the event is reset and the warning message reappears only before the oldest entry that has not been saved with the "Backup" command is overwritten. The history data saved on the diskette can be reloaded into a special file of the LMS station with the aid of the "RESTORE" command. By specifying OFF LINE in the search criteria the system is instructed to display the entries from the backup file rather than the current event file. During the search operation the normal LMS functions remain active. This means that events are displayed also while the search is in progress and that the operator can respond to them. The completion of the search operation is indicated with an audible signal. As part of the LMS configuration procedure the user can specify which events and status changes are to be stored in the history file. Historic archive size can vary from 16000 to 256000 records, according to system setting.

5 Guard Tour

The LMSmodular Guard Tour software is an add-on package to be used with the Cerberus centralized control system LMSmodular.



The Guard Tour is aimed to compel the watchmen to inspect the controlled facilities at random times and according to preset inspection paths. Generally speaking, a Guard Tour is composed by a set of “stations”, i.e. of physical checkpoints that must be activated by the watchman within some time intervals during the Guard Tour execution.



The Guard Tour stations actually are hardware devices physically connected to some subsystem configured in LMSmodular. There is no Guard Tour specific hardware: the Guard Tour is a virtual subsystem, i.e. it is a subsystem composed by different hardware devices that actually belong to other subsystems.

The Guard Tour stations for instance can be implemented using the digital inputs of CMXs, that must be configured as such. The CMX are the physical devices actually installed, but the same data points that belong to the CMX can be configured as Guard Tour stations. They belong therefore to the virtual Guard Tour subsystem, and the signals coming from these points are interpreted accordingly when the Guard Tour is active.

The Guard Tour configuration is the process during which the system manager defines the possible paths to be covered by watchmen, the physical points associated to these paths and the actions the security system as a whole must undertake to manage the Guard Tours.

The Guard Tour execution is fully managed by LMSmodular, and it makes sense only within the frame of the integrated and centralized security system management.

LMSmodular starts the Guard Tour at preset times and dates or at random times. When the Guard Tour is launched, the watchman must start to check the stations configured for the running tour. He must check each station within a time window preset. Both an earlier and a belated check trigger an LMSmodular event : they mean that something did not run as planned. Maybe the watchman detected some anomalous condition, or was stopped by someone, or some unexpected event happened. In any case some action must be taken, and LMSmodular will manage the alarm condition.

While the Guard Tour is running, the operator can follow its progress using treatment pages configured at that purpose.

Clicking on the points that represent the Guard Tour stations he can either display information or send commands to the Stations

6 Access Control

The Access Control is an evolution of the “lock and key” method that keeps your home secure. Basically, an Access Control system is designed to allow particular people entering a secured area and keeping everyone else out.

An Access Control manages the access to restricted areas. One or more badge readers control each door. When the user presents a valid “key card”, the system grants access to the controlled area.

The key cards can be both of proximity type (no contact between the badge reader and the card is required) and magnetic strip type.

Using an Access Control system you track the users inside the building, report the date and time of boundary crossing, monitors anomalous conditions (such as doors forced open or open for too long) and interact with other security and safety subsystems to keep the site secure and safe.

The Access Control system can accommodate thousands of people, each with his or her own access times and allowable doors. It can also monitor almost any kind of electrical sensing device and take appropriate action when conditions change. It can as well provide a detailed report, on paper and/or on disk, of any action it senses or takes.

The building is subdivided into zones: the doors mark the boundary between a zone and another zone. You can define as well time intervals that partition the day into periods.

You may wish to install an Access Control system simply to let some people enter the premises you manage and other people to stay out. The same function can be accomplished using the old, traditional keys. Actually even at this lowest level Access Control gives you more flexibility than the hardware key: acting on the software you can forbid an employee to enter the premises even if he will never give you back the badge, that is the modern equivalent of the hardware key.

6.1 CerPass solution



The AMS CerPass system supports CC30 control units and the related hardware.

The system identifies the person by means of his/her access card (badge). The system operator can easily change access rights at any time.

Door management functions warn, if a door is kept open longer than normal, both at the door, by means of a buzzer, and at the operators terminal. Plausibility checks (e.g. anti-passback) can make sure that one person to access a certain zone can only use a specific card. Single doors or entire zones can be permanently opened or locked from the control terminal. If desired, persons can be located in a building.

The CerPass system divides a building or an area into a number of *Zones*. A door marks the transition from one zone to the other. There is always an entry reader and there can be an exit reader or a REX button.

Time schedules play an important role in access control. For each day of the week they define one or several time intervals during which access is allowed. Holidays can be defined, for which other time schedules are valid.

Each cardholder is assigned to a *Group*. Each group is assigned a set of *Access authorizations*, whereby exactly one time schedule is linked to one zone.

CerPass system manages two categories of people: users and visitors.

LMSmodular is fully integrated with this access control system. It manages the control panels (door controllers) in a centralized way. Therefore, AMS CerPass keeps a continuously updated image of the field.

6.2 Westinghouse solution



The LMSmodular Access Control supports Westinghouse SE902, SE422, SE818 and SE4100 (NexSentry) control panels and the related hardware, such as digital input modules (MI), digital output modules (RO) and keypads.

In this system you can use standard credit card, ATM cards or custom-made cards to identify users.

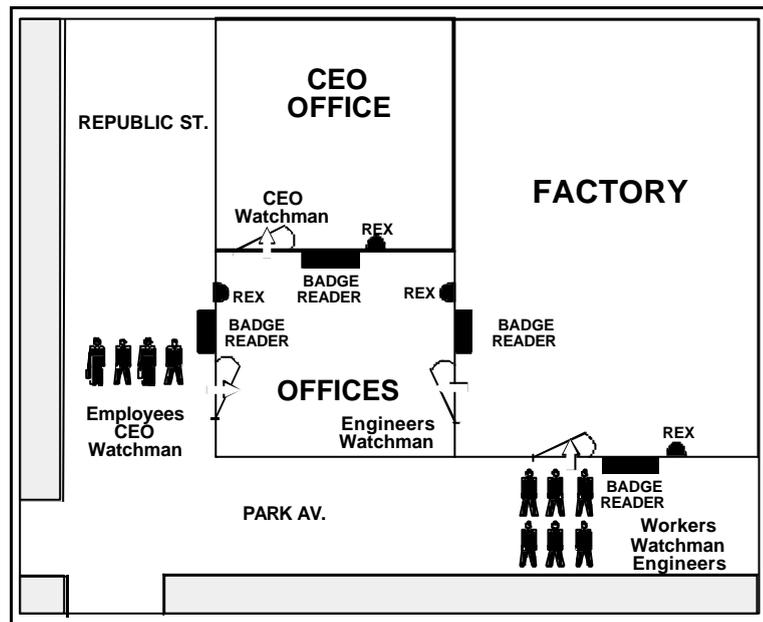
The LMSmodular Access Control manages two categories of people: users and visitors. The visitors' cards have a limited validity time. It is automatically enabled and disabled at pre-programmed times.

Each user is assigned a permission, that relates the zones with the time of the day he can access them.

To manage the hardware devices installed and to define who can enter and who must stay outside the controlled site, you need a configuration tool. The LMSmodular Access Control package is an easy-to-use interface in the Windows environment to configure the whole Access Control system.

The Access Control add-on package is fully integrated in LMS. When installed, it adds a new button to the Tools menu of LMS.

LMSmodular Access Control however can do much more than granting or denying access to a building to those who carry some piece of hardware: it selectively controls the access of some people to some part of building and during some periods, tracks the use of each door and manages a database of users that can be effectively used even for other purposes - for instance, to identify to whom is a car of which only the car plate is known.



LMSmodular Access Control duplicates at PC level most of the performances available on the AC panels installed, but it has some added value. It manages the control panels in a centralized way, therefore, LMSmodular Access Control keeps a continuously updated image of the field.

An access control system is implemented using doors that let you enter and exit some parts of the building. A door divide zones, and within each zone the people's circulation is free, by definition - no doors to control it.

7 System parameters

Parameter (max number of)	Value
LMSmodular system:	
sites	1000
Systems	1000
Subsystems	1000
Points	999999
point property fields	10000000
treatment tables	1024
description tables	1024
reaction tables	9999
Sequences	9999
time programs	9999
exception days (holidays)	200
single advisories	9999
advisory programs	9999
Operators	255
windows applications	99
running windows applications	1
Icons	65535
subsystem network addresses	10240
treatment pages	9999
foreground symbols per treatment page	50
foreground commands per treatment page	9
graphic slides (Graphic Station)	9999
foreground symbols per graphic slide	100
historic on-line records	From 16000 to 256000
guard tours	100
active guard tours	1
guard tour stations	200
guard tour stations per tour	40
guard tours per station	3
Access control parameters (WSE only; see also Cerpass documentation):	
Users	8000
Zones	Unlimited
time zones	1024
Panels	255
panels per serial line	16
historic on-line records	...
Optional devices:	
Parallel logging printers per LMSmodular station	1
Parallel graphic printers per LMSmodular station	1
Serial logging printers per LMSmodular station	1
Graphic station per LMSmodular station	1
Gateways:	
GW-20s per LMSmodular station	4 (2 with standard hardware)
GW-21s per LMSmodular station	4 (2 with standard hardware)
GW-21s and GW-20s (mixed) on the same LMSmodular station	possible
GW-21s per GW-20 at intermediate level	20
GW-20s via another GW-20 at intermediate level	not allowed
LMSmodular stations per GW-20	4
Subsystem lines per GW-20	20 (16 if either NISE or FHI Pad is installed)
LMSmodular stations per GW-21.04	2
LMSmodular stations per GW-21.06	2
Subsystem lines per GW-21.04 with one LMSmodular stations	3
Subsystem lines per GW-21.04 with two LMSmodular stations	2
Subsystem lines per GW-21.06 with one or two LMSmodular stations	4

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