PSA

Programming Sequence Aid

User Manual

Contents

Ed. 1 January 2005

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1. Introduction

This manual describes the functions of the 0.1 version (under test release) of the Programming Sequence Aid (PSA) SW.

2. Operating mode

PSA SW is designed to program the relay opening/closing commands that are transmitted at a pre-established time and date to the units of the LIN10x family.
A set of commands linked to an annual programming calendar can be defined for each LIN10x unit; this association is defined as 'procedure'. Therefore, a procedure can be considered as an annual ”programmer clock” that controls several relays of the same machine.

In order to send commands to the LIN10x units managed, the program must always be active on the PC on which it is installed. Similarly, the clock and calendar of the PC must be updated with the exact time and date. These elements are essential for precise transmission of the commands to the LIN10x.
The units managed are constantly monitored through periodic polling and any communication errors are displayed in the related window.

A trace of each command sent towards the peripheral units is maintained in a circular log file in which the effective time of transmission and the result of the operation are recorded. It should be noted that as there is no check on the effective status of a relay (open or closed) following execution of a command, only the successful or unsuccessful transmission of the command is recorded.

Connection of the peripherals

Up to 8 LIN10x units can be connected to the Management PC on a serial link (RS232) or via a LAN or Internet. For connection and configuration of the LIN102 and LIN103 units as indicated above, refer to the respective manuals:

-LIN102 user manual
-LIN103 user manual
-LIN10x family installation guide

all of which can be downloaded from the site www.elprovideolabs.com

Manual control

Apart from the procedures configured, the LIN10x units can also be controlled manually. In this case, the status of the relay can be displayed at any time for each unit and the open/close commands can be sent directly. These commands will also be recorded in the log file.

Procedure and calendar

Each procedure may consist of two blocks of 16 commands each associated to a calendar. These commands must necessarily refer to the relays of the same LIN10x units.
Several procedures can be associated to each unit. A maximum of 100 procedures can be managed.

Leap years
Leap years are managed automatically according to the calendar of the PC, i.e. it is not necessary to indicate any particular behavior for February 29.

Summer time
The change to Summer time and vice versa is managed automatically:

- Change from Summer time to solar time (clock moved back one hour): the commands carried out during the “repeated” hour are performed once only.
- Change from solar time to Summer time (clock moved forward one hour): the commands that are to be performed in the hour “skipped” are transmitted at the beginning of the new hour

Warning: for this function, the clock of the PC must be configured with the "Change automatically to Summer time" option activated!

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3. Installation

The PSA SW must be installed on PCs with Windows 98 or XP operating system. The SW occupies around 10 Mbytes of disk space. The installation procedure is fully guided and the SW is allocated automatically in the \ELPRO\PLC folder.

The PC must equipped with the communication interfaces to be used to manage the LIN10x units: RS232 or LAN card for local management, modem for management via Internet.

Note:
Remember that a fixed IP address is necessary for management via Internet and that, at the moment, no security or authentication protocol is envisaged for access to the remote LIN10x units!

4. First execution of PSA

The first time the SW is run, the work files necessary for management of the LIN10x are initialized and the **Reset procedures file!** message is displayed (this must be confirmed with OK) and then the initial window.

This window provides information about the SW release being used. To start the program, select the **START** button. The two main windows for control and configuration of the LIN10x units and procedures are displayed.

At this point, carry out the following operations in the order indicated:

- configuration of the peripheral units to be controlled
- configuration of the procedures (calendar and commands)

Creation (or subsequent modifications) of the peripheral units and procedures is followed by a "procedure compilation" phase in which all the data entered will be correlated in order to create the sequence of commands to be sent each day.

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5. Configuration of the peripheral units

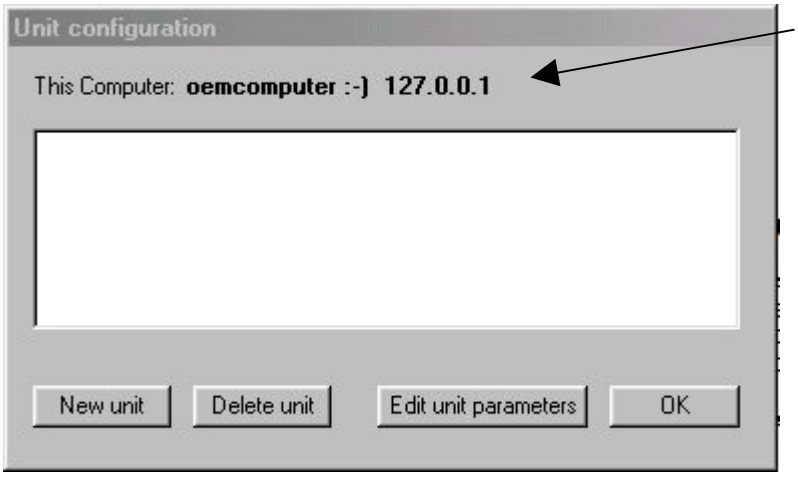
This operation must be carried out before configuring the procedures.

To access configuration of the peripheral units, select the **Unit Configuration** button in the status window.

During configuration operations of the peripheral units and of the procedures the part of the program that controls transmission of the commands is de-activated. This is to avoid the possibility of transmission of commands programmed with a no longer valid configuration or one that must be modified.

Confirmation of de-activation of any active procedures is requested before displaying the peripheral configuration window.

Once de-activation of active procedures has been confirmed, the window with any units configured is displayed.



Name and IP address of the PC on which the PSA SW is installed

Here, you can add, cancel or edit the parameters of the peripheral units. A new unit is created using the **New Unit** key

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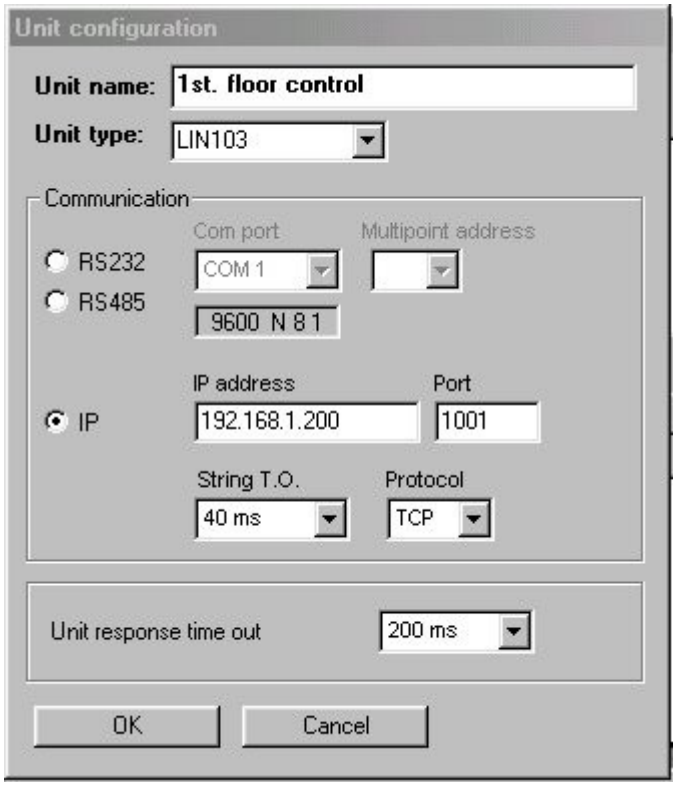

In this example, a LIN103 type peripheral on local network with TCP protocol has been created.

The IP address is that configured on the remote LIN103.
Remember that the LIN103 must be configured as SLAVE.

Note:
At the moment, RS485 multipoint connection is not available for the LIN102 and LIN103 units. This parameter is reserved for future developments.

The default parameters set relating to:

- String T.O. : time-out to detect end of reception of a packet (for IP protocols)
- Unit response time-out : peripheral response time-out

are optimized for serial interface or on LANs; if the Internet is used as interface, it may be necessary to modify these parameters. In particular if a dial-up telephone line is used or the Internet connection is very slow, the "String T.O." and also the "Unit response time-out" will have to be increased until the values that permit correct reception of the reply of the unit connected are found.

For connection via serial line, the LIN10x peripherals can be connected directly to the COM of the PC in RS232. The RS485 interface is not available on the LIN102 and LIN103 peripherals; this parameter is reserved for future developments.

After configuring (or modifying) the data of the peripheral confirm with **OK**.

The new unit will appear in the list of units configured:

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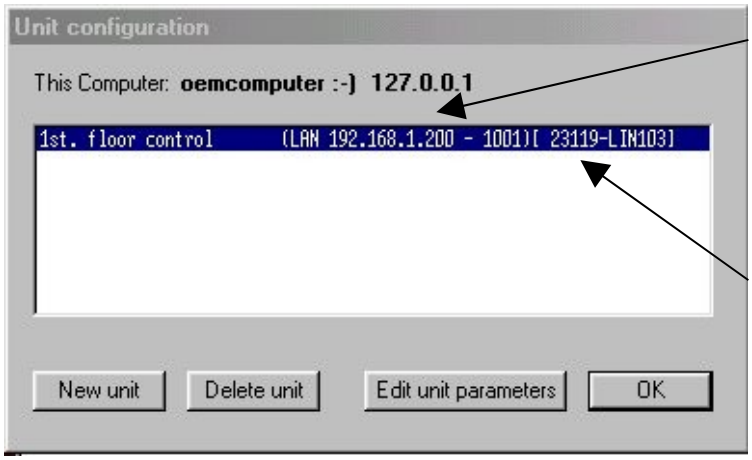


The name of the unit, the type of interface used and the type of unit are indicated.

Identifier used by the SW for this LIN10x

After configuring (or modifying) the units to be managed, quit this phase with the **OK** confirmation key.

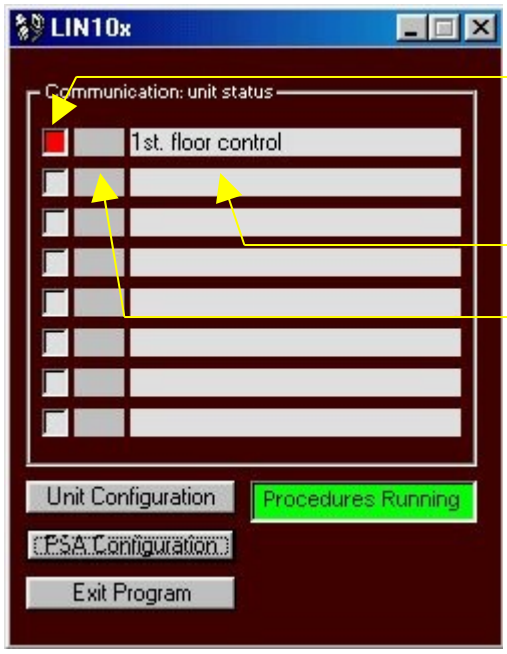
Deletion of a peripheral unit (using the **Delete unit** key) causes cancellation of all the procedures that have been configured for this.

On exiting the configuration phase, the existing procedures will be recompiled as the data of the units managed have been modified.

Before configuring the procedures, it is good practice to check the status of the connection with the units configured so far with manual management (see par. 9. Manual control)

6. Configuration procedures

This operation must be carried out when all the peripheral units managed have been configured correctly.



Status of the communication:
RED: error/unit not connected
GREEN: unit connected and replies correctly
YELLOW: polling of unit in course

Unit name

Identifier of the unit connected (when it answers the polling)

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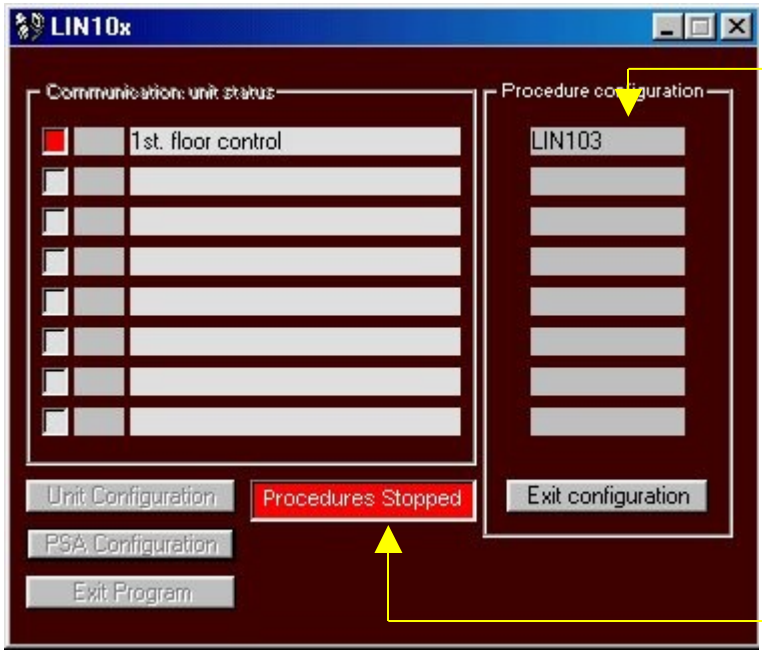
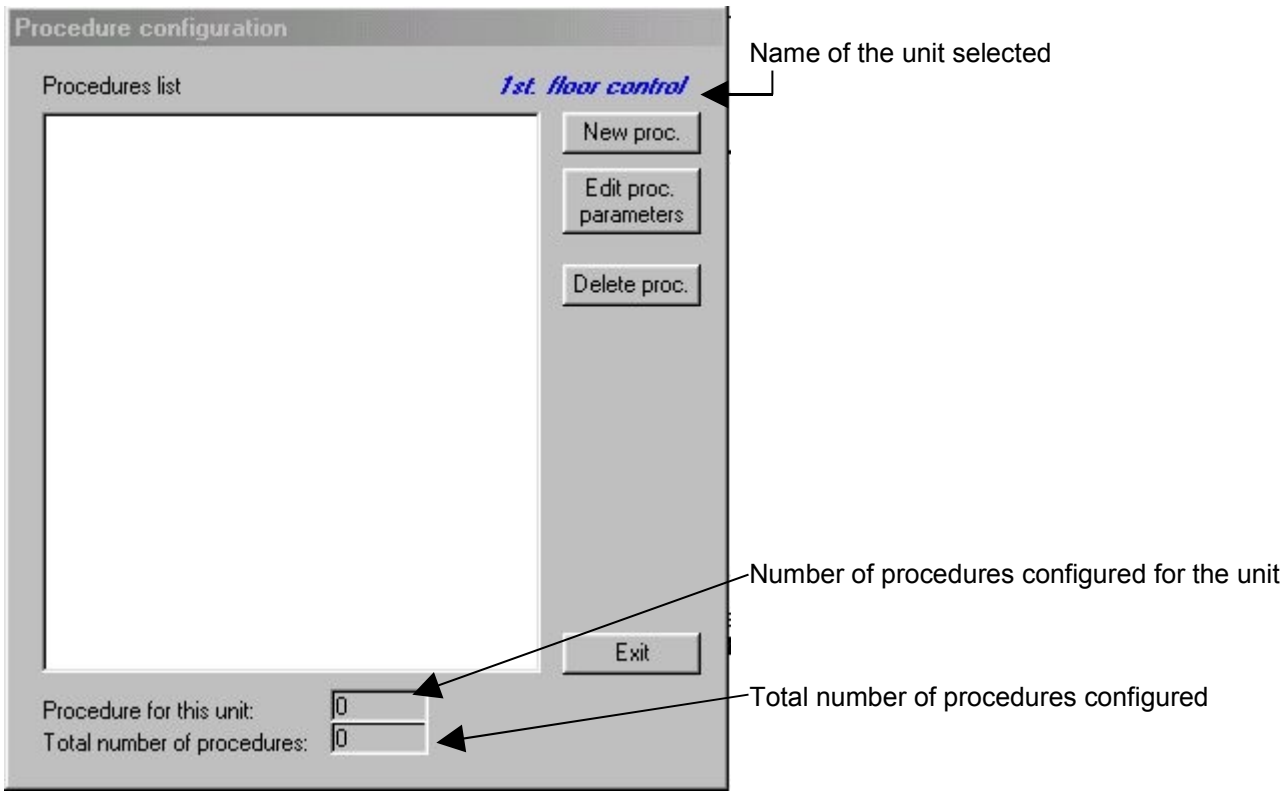
To access procedure configuration, select the **PSA Configuration** button in the status window.

Before proceeding with configuration, you will be asked to confirm de-activation of any active procedures. After confirming de-activation, another column with the types of units configured is displayed in the status window:



Clicking on unit type accesses procedure configuration for the unit selected and a window with the list of any procedures configured is displayed:



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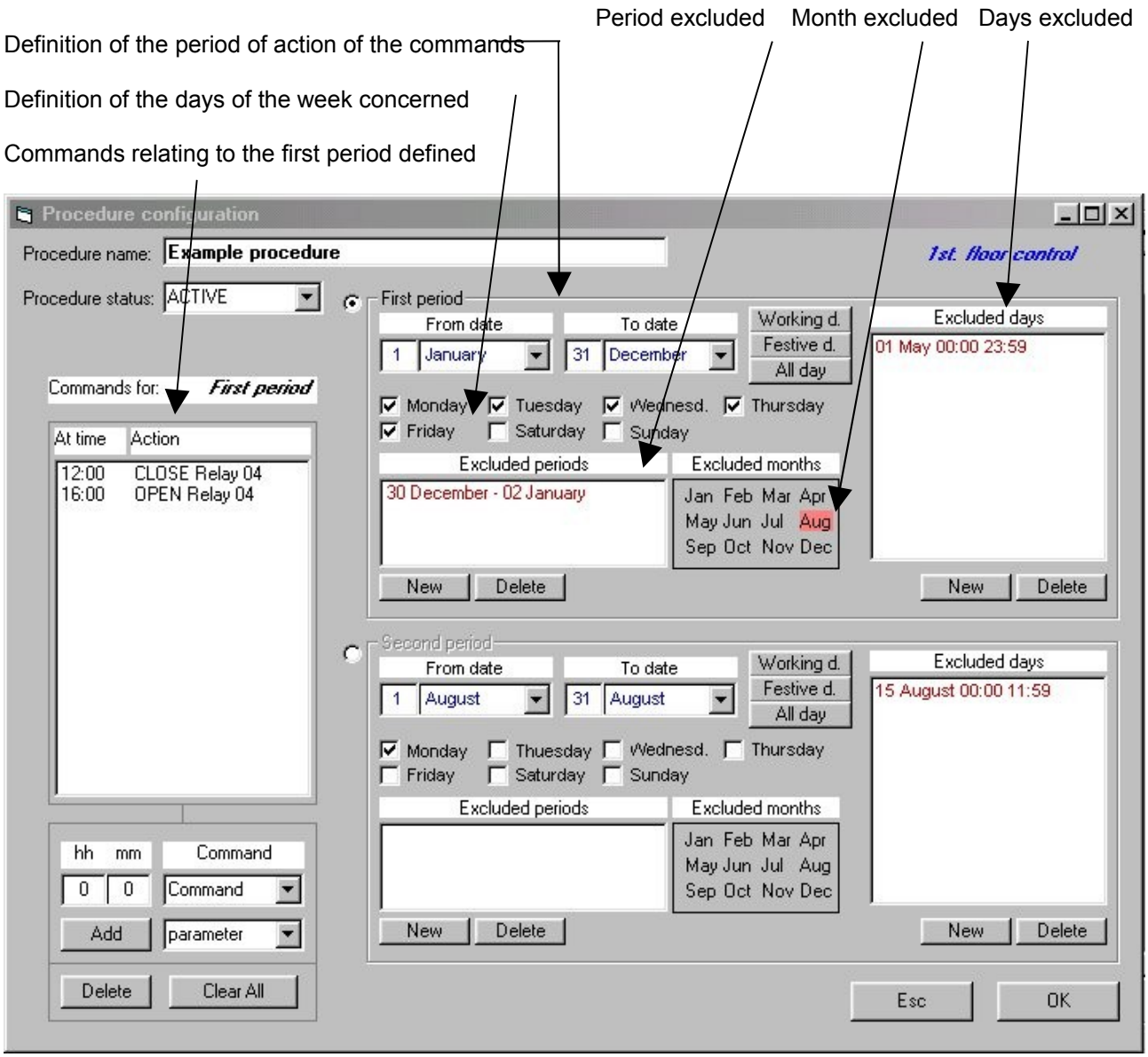
Here, you can add, cancel or edit the parameters of the procedures configured for the unit selected with the **New Proc** key.

A procedure that complies with the following requirements has been configured in the example below:

Relay 4 must be closed from 12 :00 to 16:00 each working day of the week for the whole year except for:
- the month of August
- the period from December 30 to January 2
- May 1

Also, a different type of management is adopted for the month of August:
Relays 1 and 2 must be closed from 9:00 to 10:00 each Monday of the month except for the first half-day of August 15.

To obtain this type of behavior, a procedure that uses both the periods planned must be configured; the 1st period is defined as shown in the figure below:



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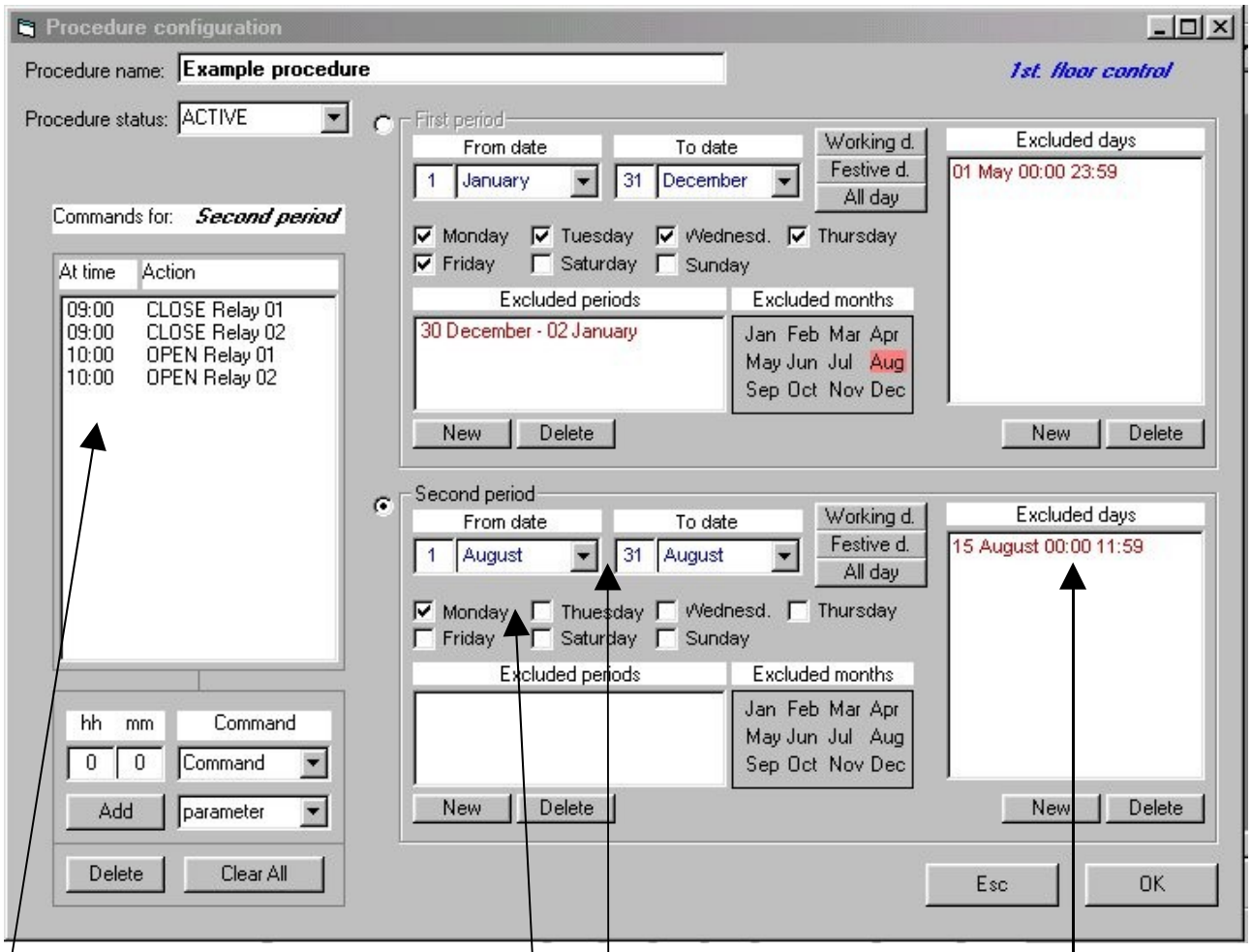
the second period is defined as follows:



Commands to be sent for the second period

Days of the week affected by the commands

First 1/2 day excluded

Definition of the period of action of the commands

An option defined with "**Procedure status**" is provided for each procedure; this can be used to activate or de-activate a procedure at any time. This may be useful during maintenance of the plant controlled.

Once you have defined the periods and commands, confirm with the **OK** key.
The window will be closed and the list with the new updated procedure added will be displayed.

To end the procedure configuration phase, you must also exit from the "Procedure configuration" window (with the **EXIT** key) and then select the **Exit Configuration** key of the "LIN10x" main window.

At this point, compilation of the data entered is started, at the end of which all the procedures configured will be activated.

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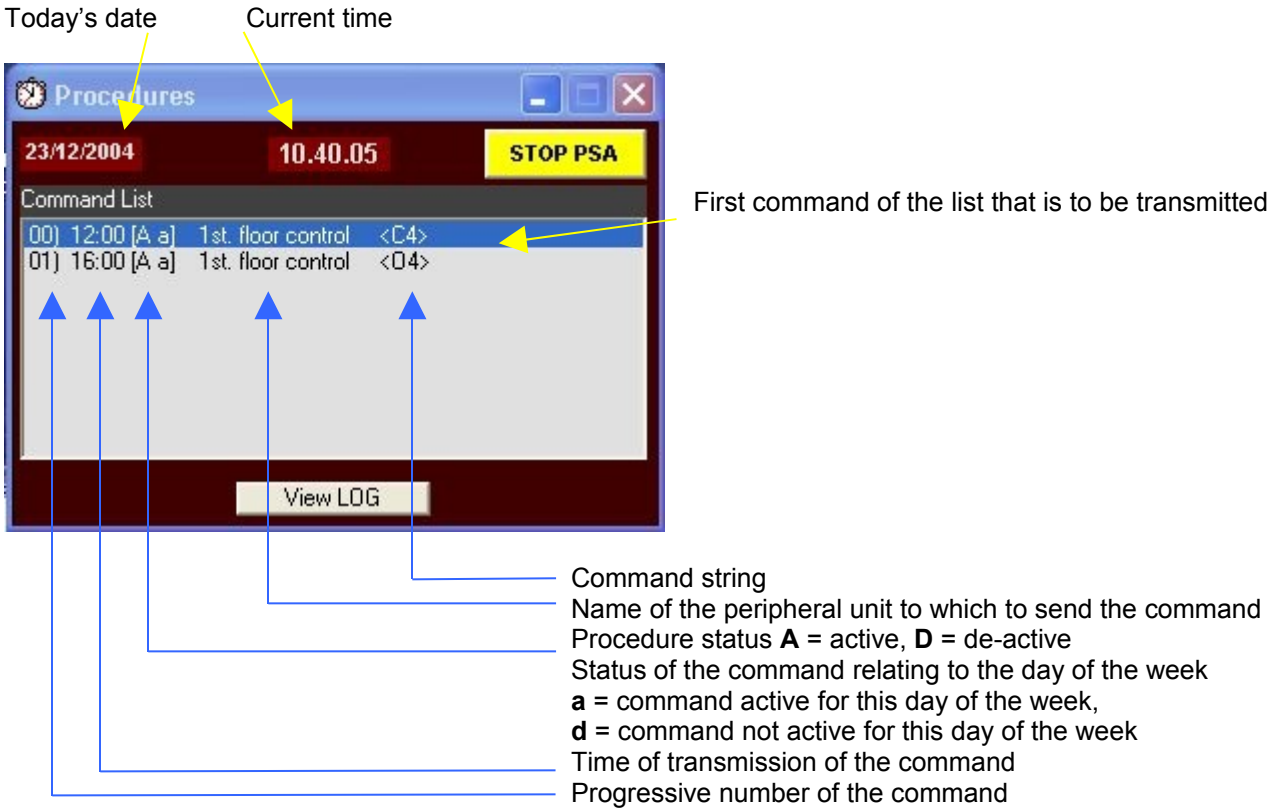
7. How to send commands

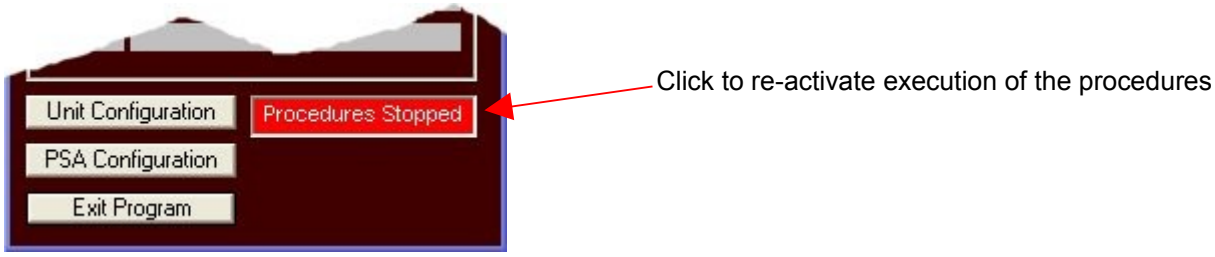
During normal functioning of the program, a window is displayed with the list of commands of the day that must be transmitted to the peripheral units:



In this list, the first command that will be transmitted to peripheral unit is highlighted; indication is also provided of whether that command belongs to a procedure that has been de-activated with the **Procedure status** option described above and if the day of the week (Monday, Tuesday etc) is affected by the command.
In the example, the description **[Aa]** indicates that the procedure is active and the day is affected by the command (as configured for the first period of the procedure provided as example).

This window manages effective transmission of the commands to the peripheral units and must always be active; otherwise, execution of the procedures is interrupted.
Execution can however be interrupted with the **STOP PSA** key; in this way, manual management of the peripherals is always possible.

The procedures are re-activated by clicking on the box that shows the status of the procedures **Procedure Stopped** of the "LIN10x" window:



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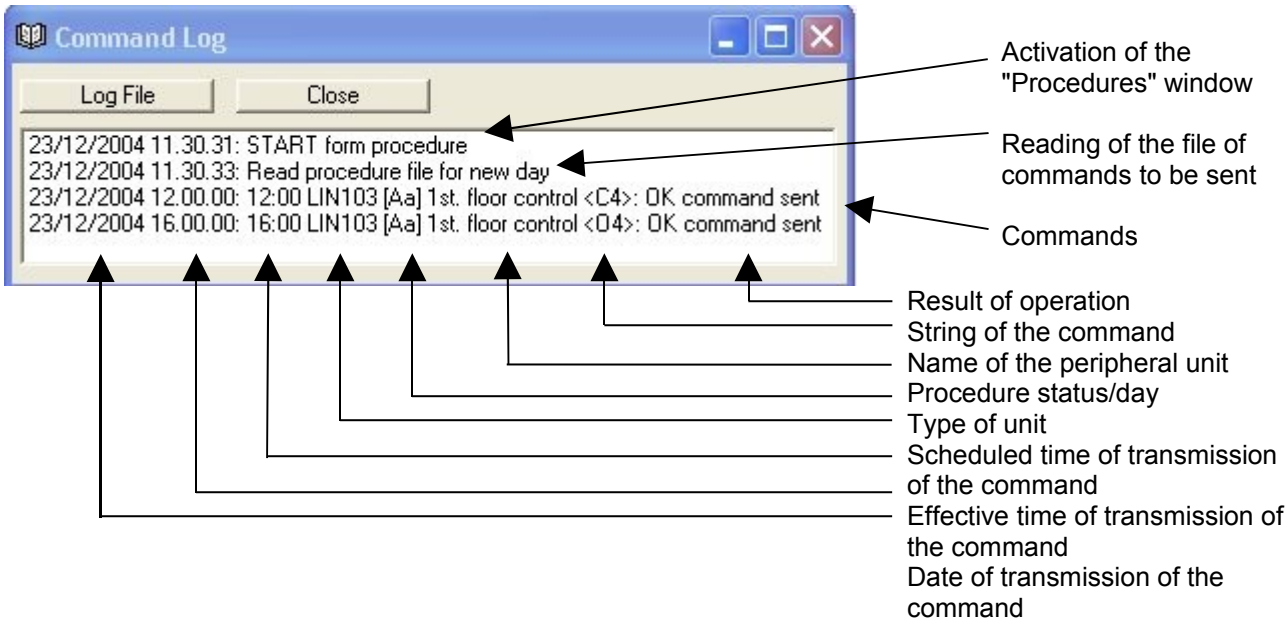
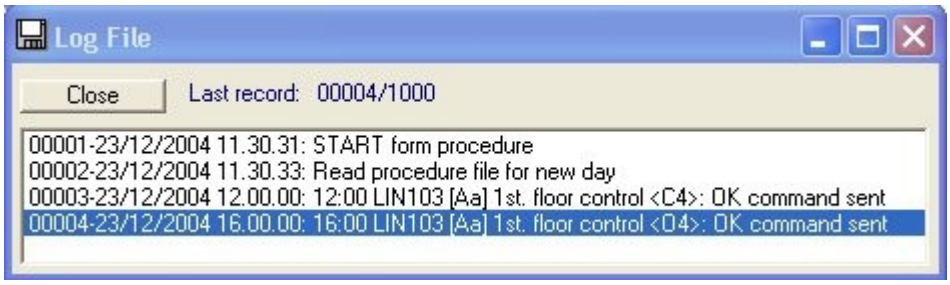
8. Command log

You can display the command log using the **View LOG** button in the "Procedures" window:



Only the events that have occurred from the start of execution of the program are listed temporarily in this window. In addition to the schedule time of transmission, the effective time of transmission of the command and the related outcome are also indicated for each command sent.
In addition to logging the commands transmitted, the date and time of execution of the program and any activations and de-activations of the procedures are also indicated.

It is also possible, from this window, to access the log file in which the last events that have occurred are saved in a circular rile (using the **LOG File** key):



This window contains the same information as the previous window but relating to the last 1000 events that have occurred; in addition there is only the sequential number of the record of each event. As the file is circular, the last record written may be in any position of the list.

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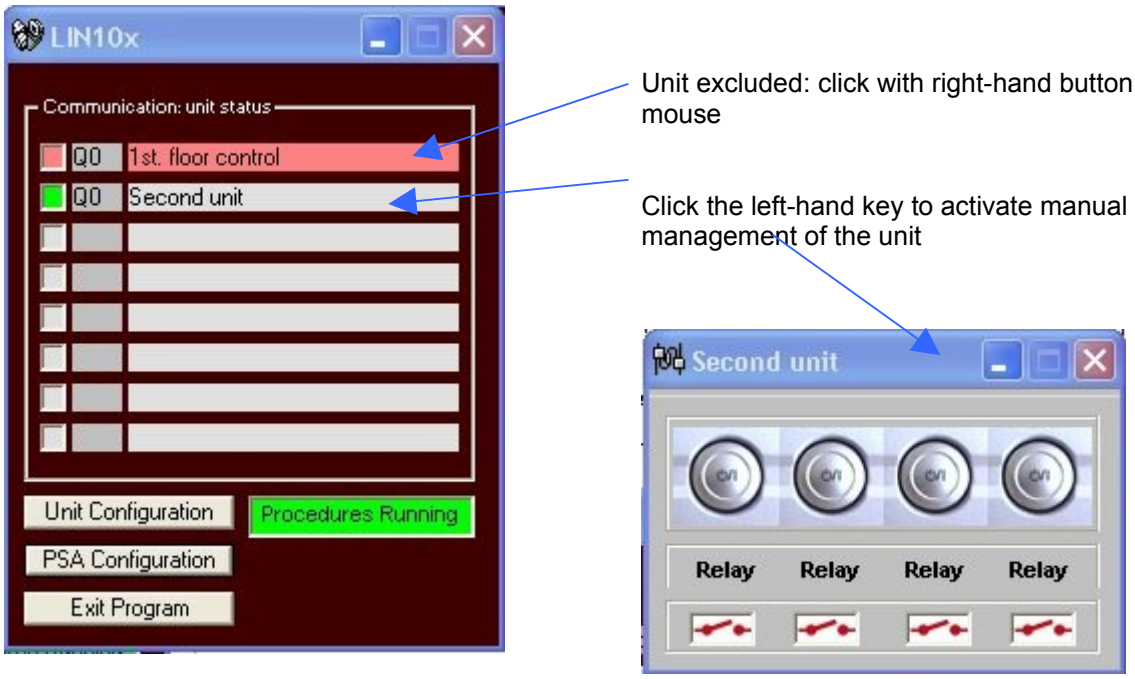
9. Manual control

Commands can be sent manually to the peripheral units configured without affecting functioning of any active procedures. To send the commands manually, select the peripheral required by clicking with the left-hand button of the mouse on the unit name in the "Status LIN10x" window:



Any commands send manually are recorded in the LOG file.

A unit can be excluded from periodic polling by clicking with the right-hand button of the mouse on the unit name; in this case, any commands present in the procedures will not be sent and an error condition will be recorded in the log file. To re-include the unit, click again with the right-hand button of the mouse.

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