

APPENDIX

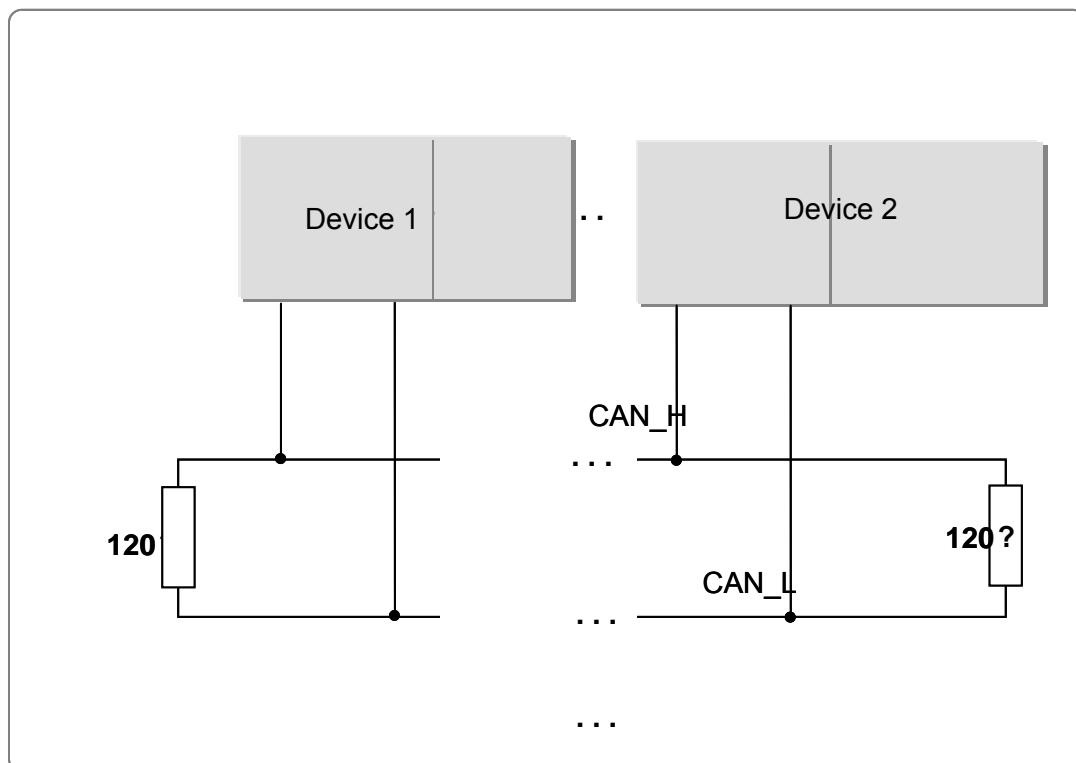
Interactive Fire Control Panel FS7002 – Operation in Local Network

CAN – Controlled Area Network – is a serial communication protocol intended for steady and reliable data exchange and real-time control of hardware devices associated in a network. It has been developed to expand the communication capability between the devices by allowing a high-speed data exchange at lower realization price in the devices. The maximum data transmission rate is up to 11 Mbit/s. In the table below are given the parameters of the CAN channel depending on the distance and on the bit rate:

Max. Distance	Bit Rate	Type
10 m	1.6Mbit/s	High-speed
40 m	1.0Mbit/s	
130 m	500kbit/s	
270 m	250kbit/s	
530 m	125kbit/s	
620 m	100kbit/s	Low-speed
1300 m	50kbit/s	
3300 m	20kbit/s	
6700 m	10kbit/s	
10 000 m	5kbit/s	

The maximum distance between two devices shall be determined according to the data transmission rate.

In *High speed* mode of operation the line shall be terminated at both ends with 120 Ω characteristic impedance.

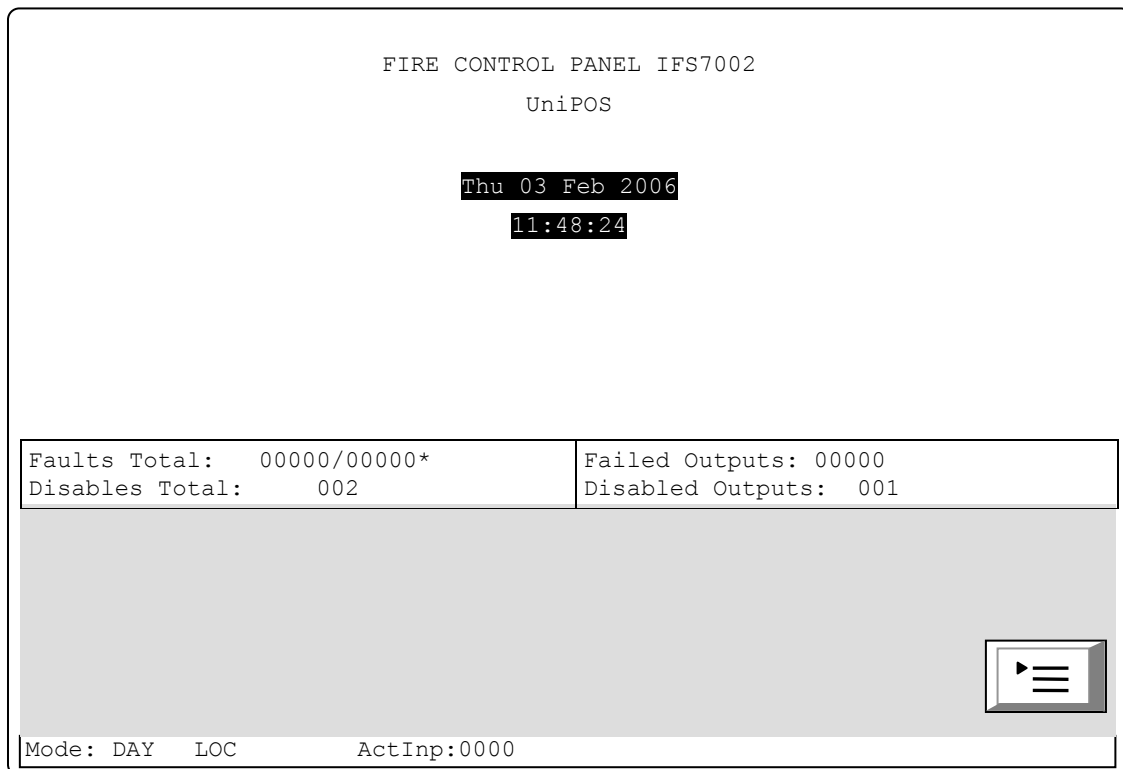


In IFS7002 the fire alarm line termination is done by the appropriate jumpers situated on the main board.

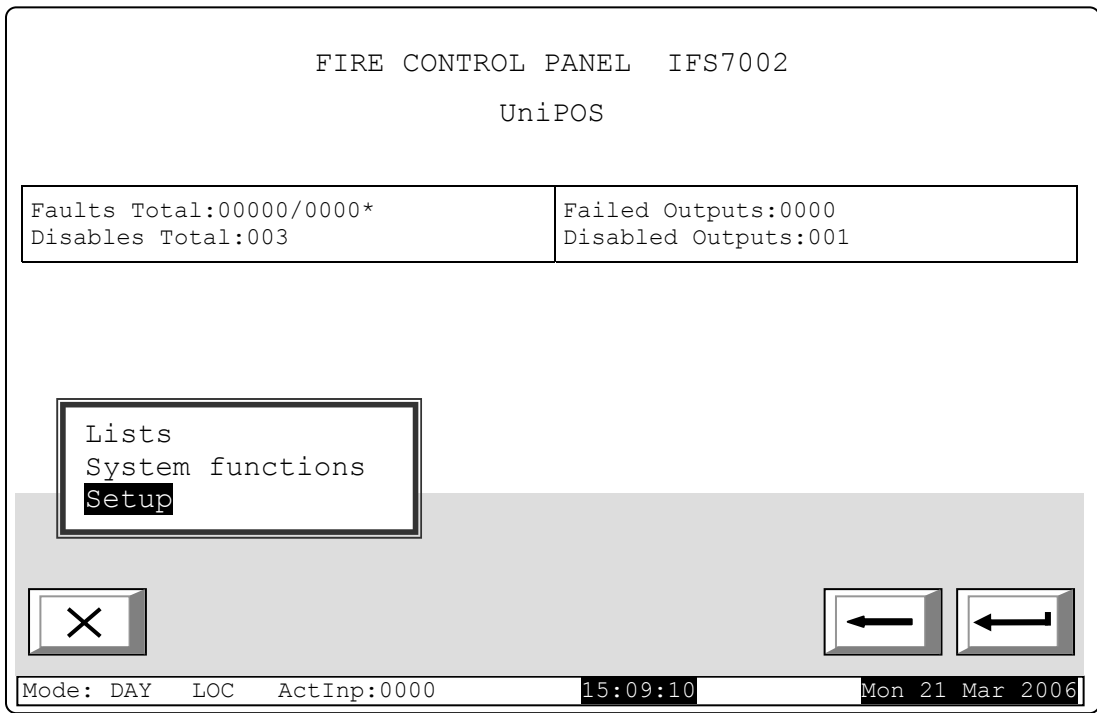
IFS7002 can support two CAN interfaces. Need for more interfaces appeared due to the requirements for development of complex topologies and networks of fire control panels. The CAN interface allows design of branched networks, which facilitates development of fire alarm systems in accordance with site specifications. At the same time it provides option for logical association of devices having various CAN interfaces. It is specifically useful in cases with remote control and configuration of remote fire control panels.

Control panel configuration is performed as follows:

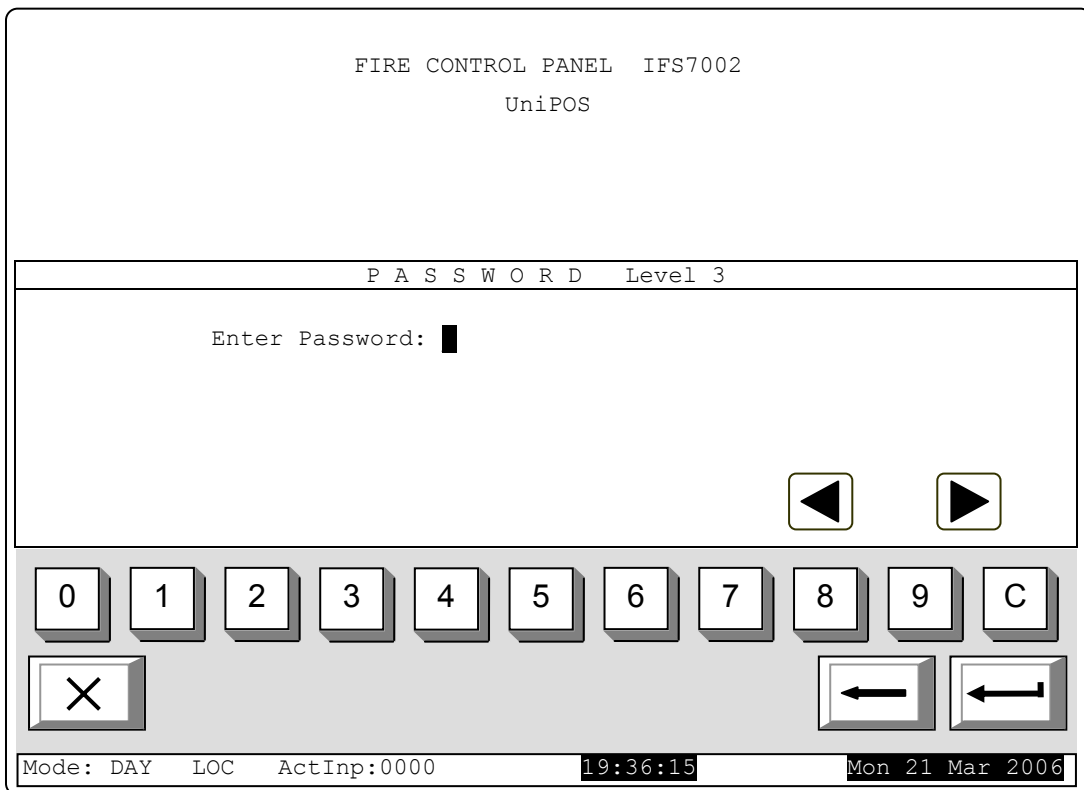
1. After the control panel is power supplied and the display is set after initialization the following screen appears:



The button in bottom right activates the menu of the fire control panel. Following the steps displayed next you may reach the menu for CAN interface setup and adjustment.

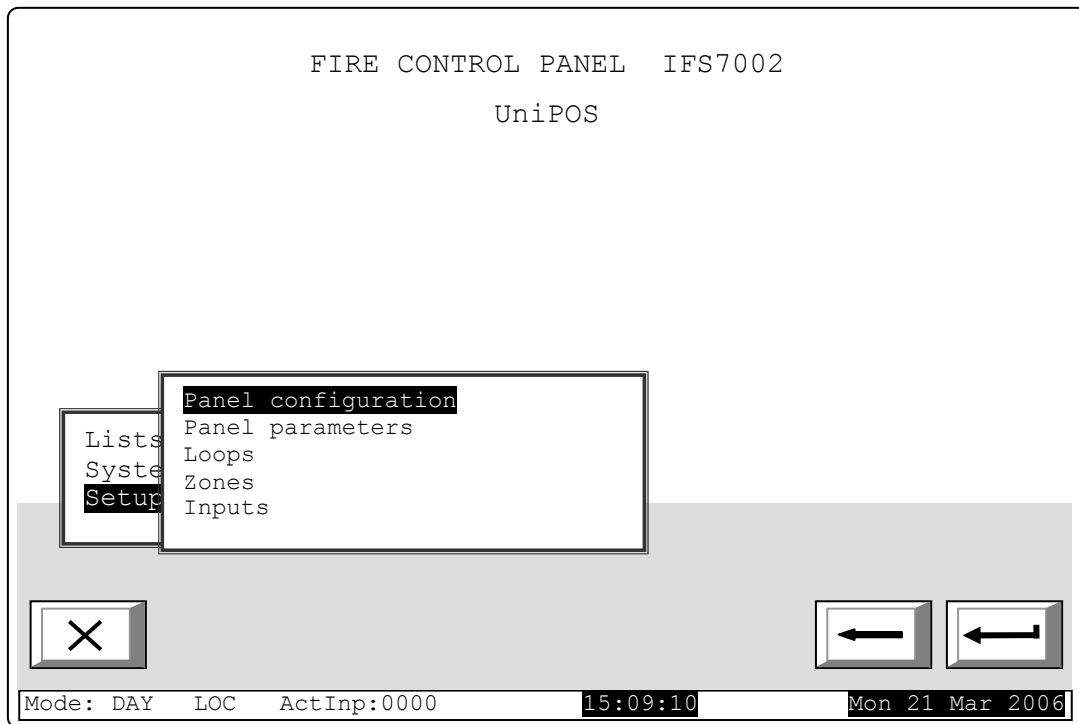


After the SetUp Menu is selected through the stylus, the following screen appears:

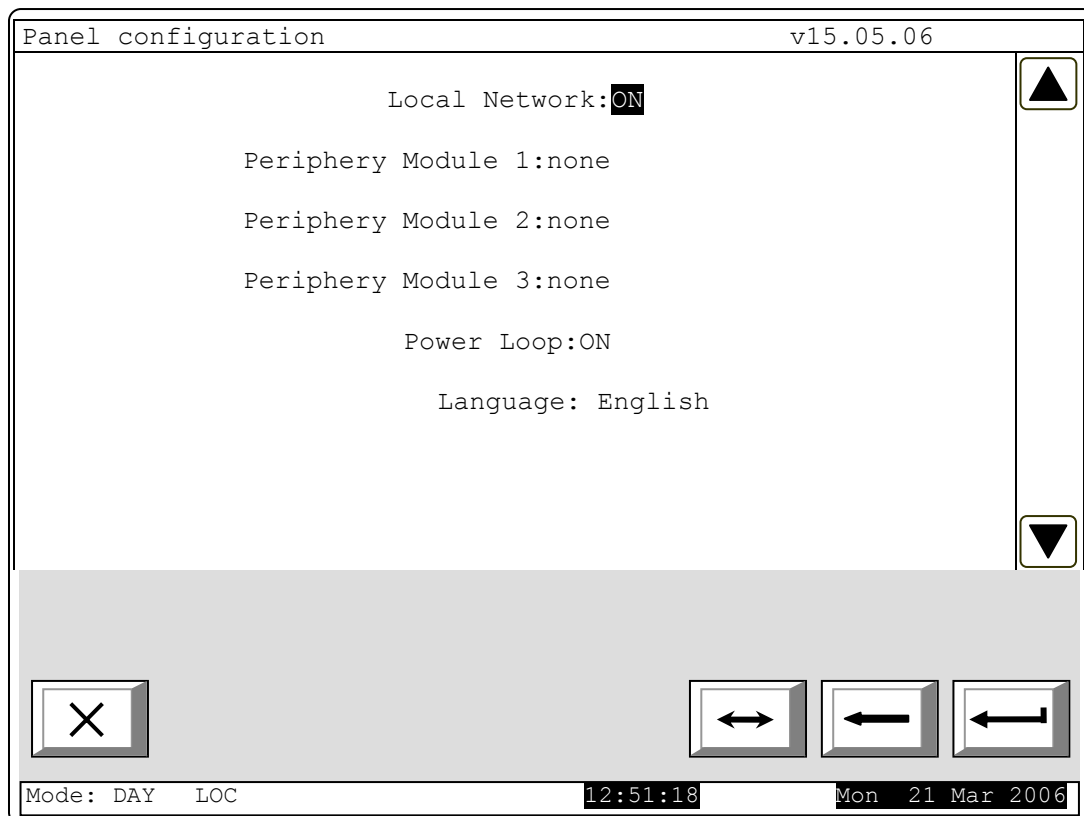


Access password for Level 3 is needed here and the operator will be allowed to continue the configuration process.

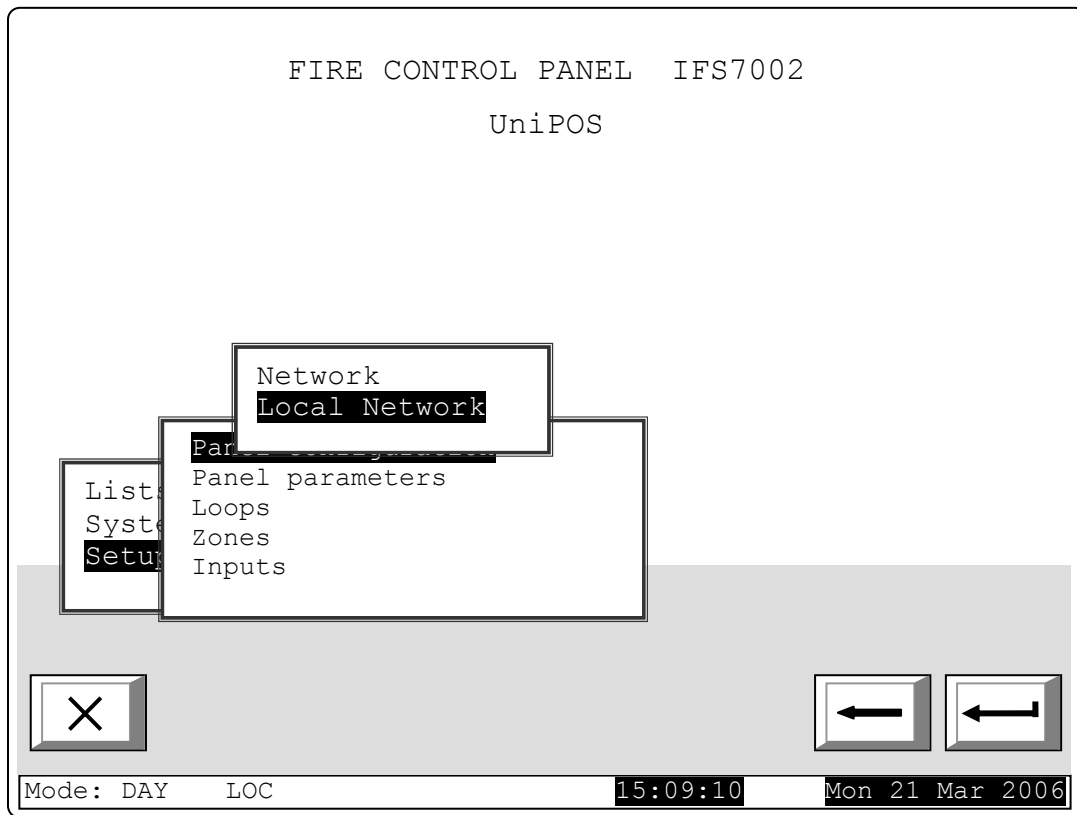
As soon as the correct password is entered, select the following menu:



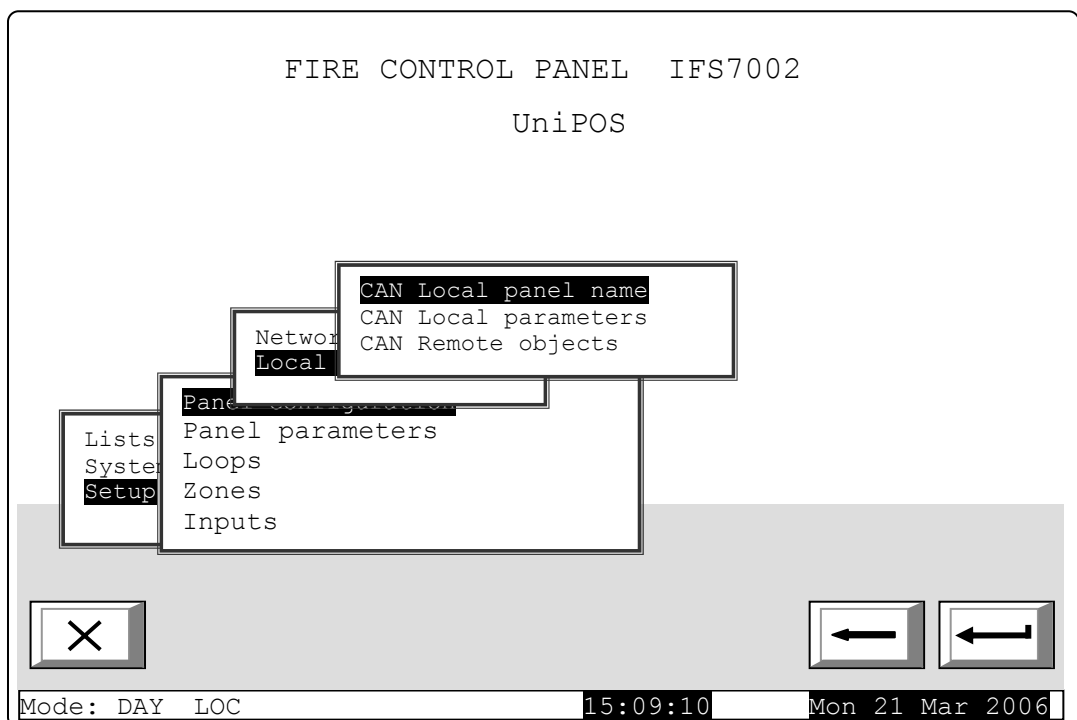
To allow access and use the CAN interface, select Local network – ON from the next menu.

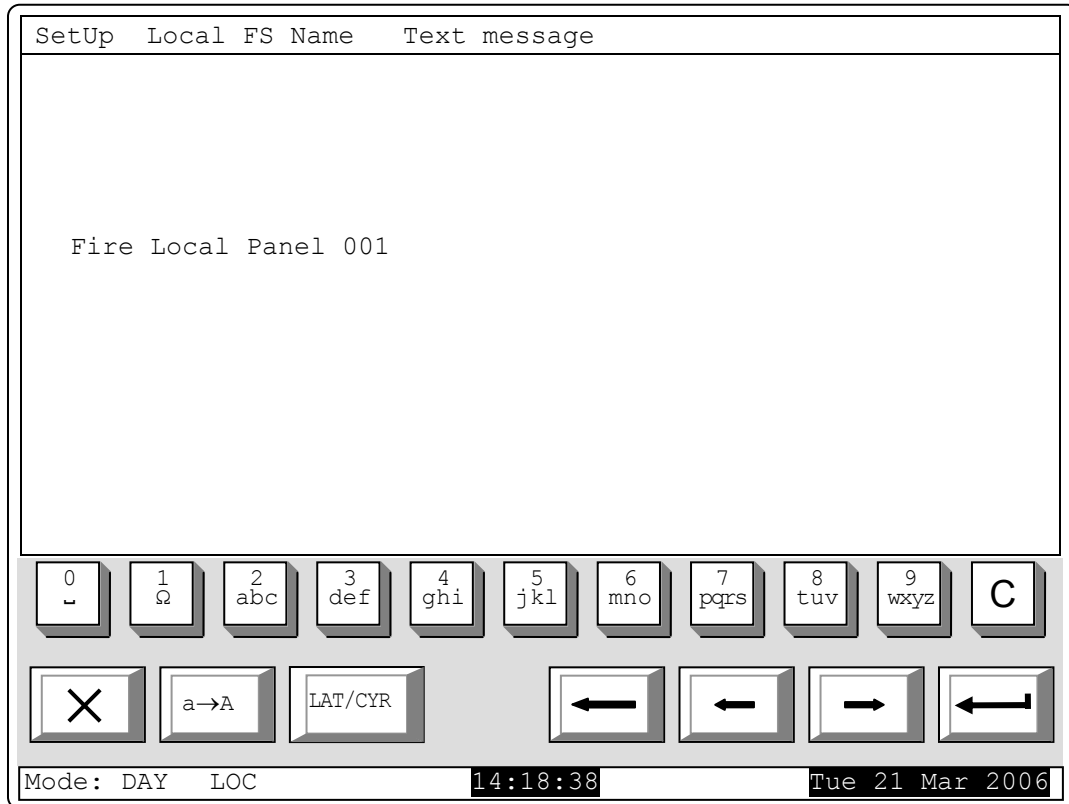


After the CAN interface is activated, proceed to setup of CAN parameters in *Control Panel Parameters / Local network* menu .

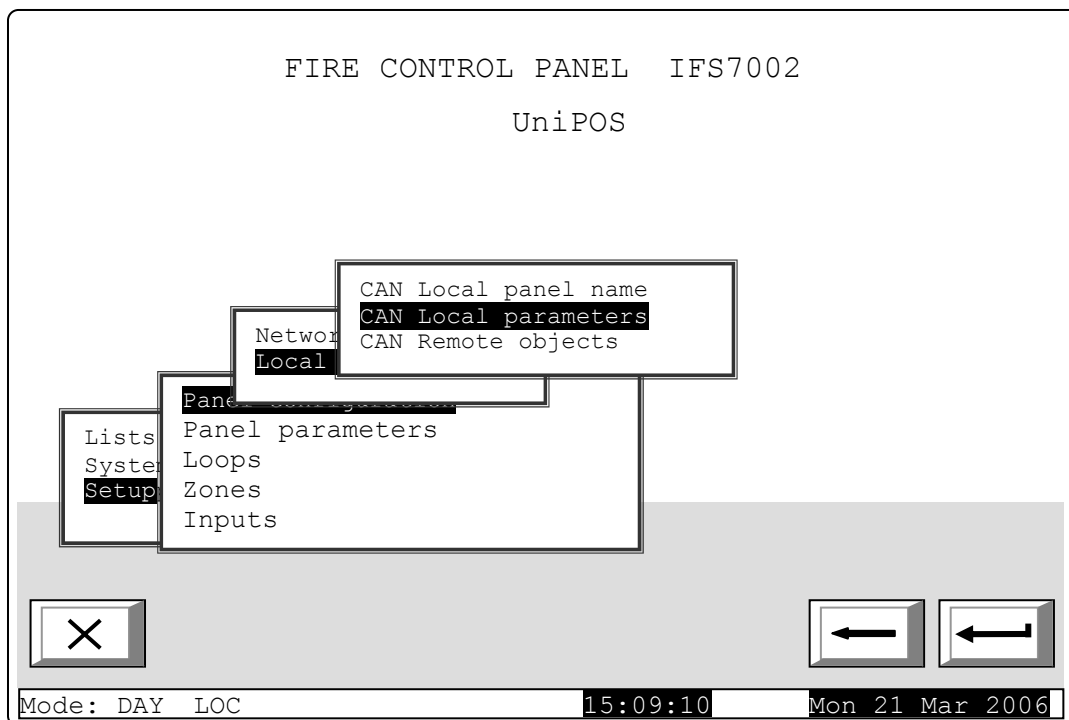


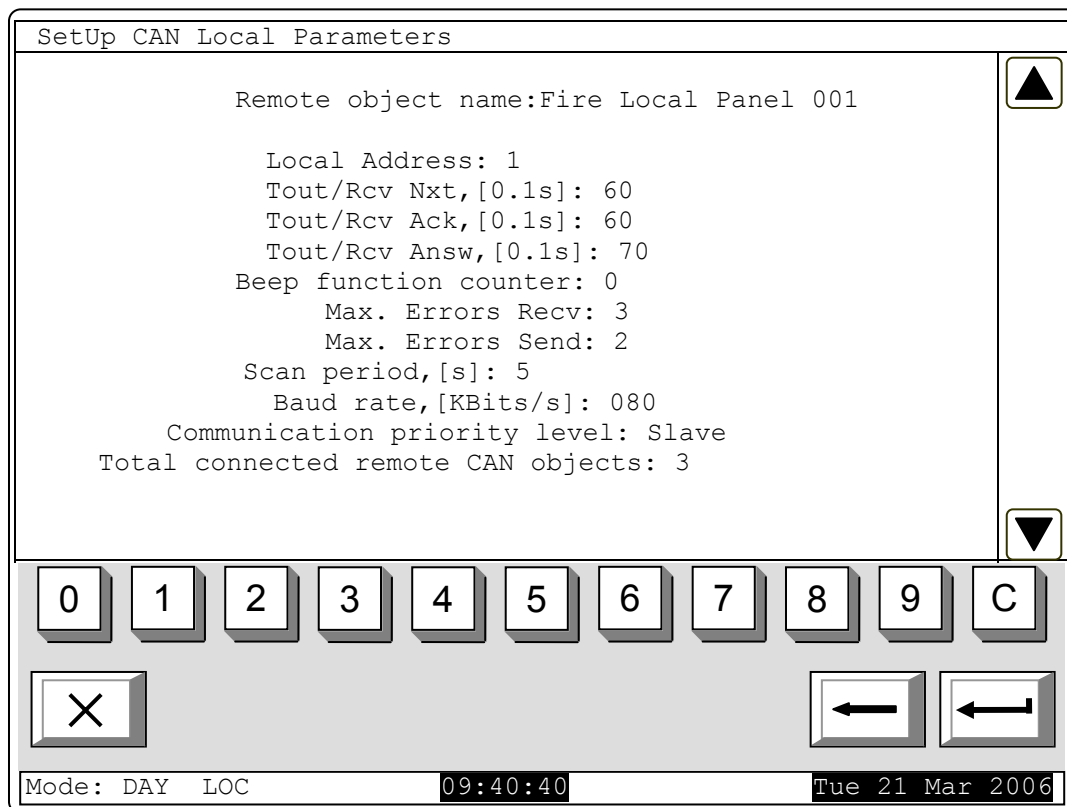
Using the arrows, select *Local parameters*, then *Local network*.





In *CAN Local panel name* select the option for assigning a name to the local object. The name of the local object is a randomly composed string and may contain letters and figures (up to 20). After reverting to the main menu you may continue the configuration of the local parameters.





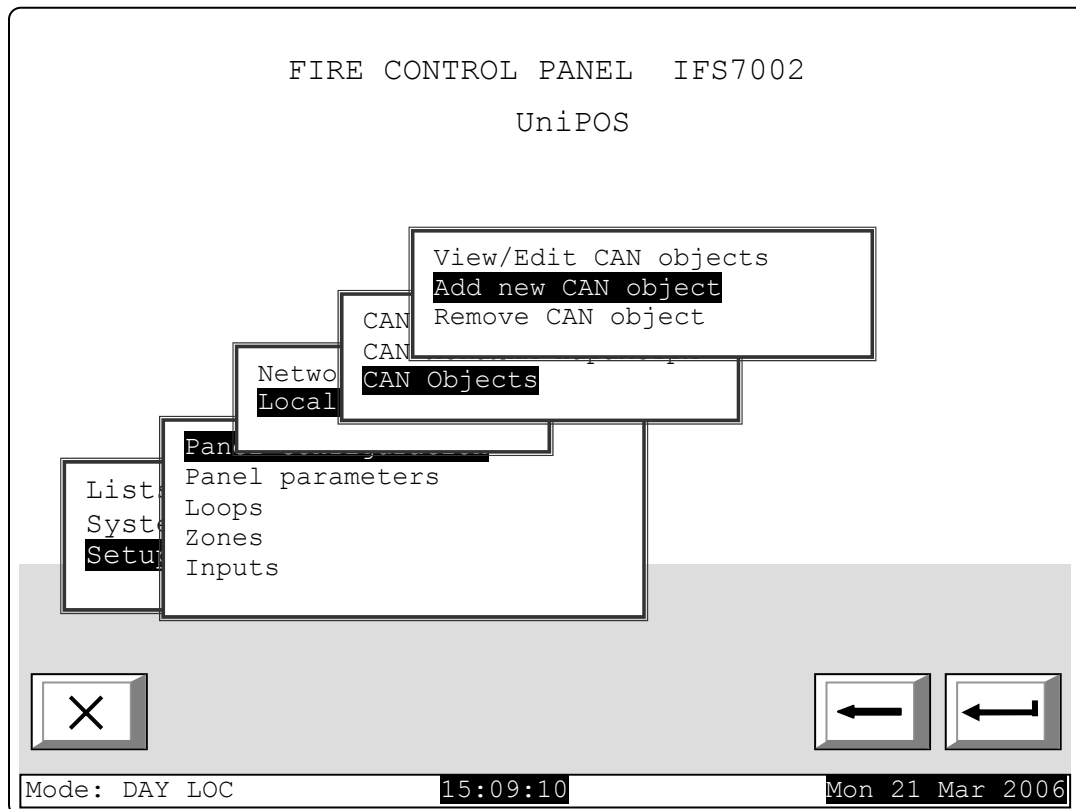
- Local Address: - from 0 to 127;
- Tout/Rcv Nxt,[0.1s]: – maximum awaiting time for receiving the next part of a telegram (a long message). Default value – $15 \times 0.1s = 1.5s$. Possible range – 1 to 120;
- Tout/Rcv Ack,[0.1s]: – maximum awaiting time for receiving confirmation after a telegram – command/message is being sent, which does not require responds. Default value - $20 \times 0.1s = 2.0s$. Possible range – 1 to 120;
- Tout/Rcv answ,[0.1s]: – maximum awaiting time for receiving respond to a sent telegram, which requires respond. Default value – $20 \times 0.1s = 2.0s$. Possible range – 1 to 120;
- Beep function counter. At assigned value 0 no beep is produces – a short sound from the beeper meaning a successful check on the local control panel's connection with the consequent remote control panel. At value $N > 0$ the beeper will release signal upon each successful N-check. For example, if $N = 1$, each check, performed during each *Check period, [s]* will be signaled. Default value – 0. Possible range – 0 to 100.
- Max. Errors Recv: – number of CAN communication errors upon receiving telegrams from remote control panels; after this number is reached the respective control panel is considered as “dropped out” (temporarily) from the CAN, and fault condition is signaled – failure in connection with remote control panel, address...Default value – 3. Possible range – 1 to 20.
- Max. Errors Send: – number of CAN communication errors upon sending telegrams to remote control panels; after this number is reached, the respective control panel is considered as “dropped out” (temporarily) from the CAN, and fault condition is signaled – failure in connection with remote control panel, address...Default value – 3. Possible range – 1 to 20.
- Scan period, [s]: – a time interval is set and after it is expired, the local control panel will run a check (scan) the state of the CAN communication with the connected remote control panels, including the dropped out panels. Default value – 10 s. Possible range – 1 to 250 s.
- Baud rate, [KBits/s]: Possible values - 640, 320, 213, 160, 128, 106, 91, 80, 71, 64, 58, 53, 49, 45, 42, 40, 35, 32, 29, 26, 24, 22, 21, 20, 17, 16, 14, 13, 11, 10 [KBits/s];

- Communication priority level: – the position of the control panel in setup condition, in the constructed CAN is defined here. Possible values – *Master* and *Slave*. One of the control panels participating in the IFS 7000 CAN shall be defined as *Master*, and all other control panels in the network shall be defined as *Slave*. The master control panel shall be connected to the rest of the control panels in the network – directly or via repeater.

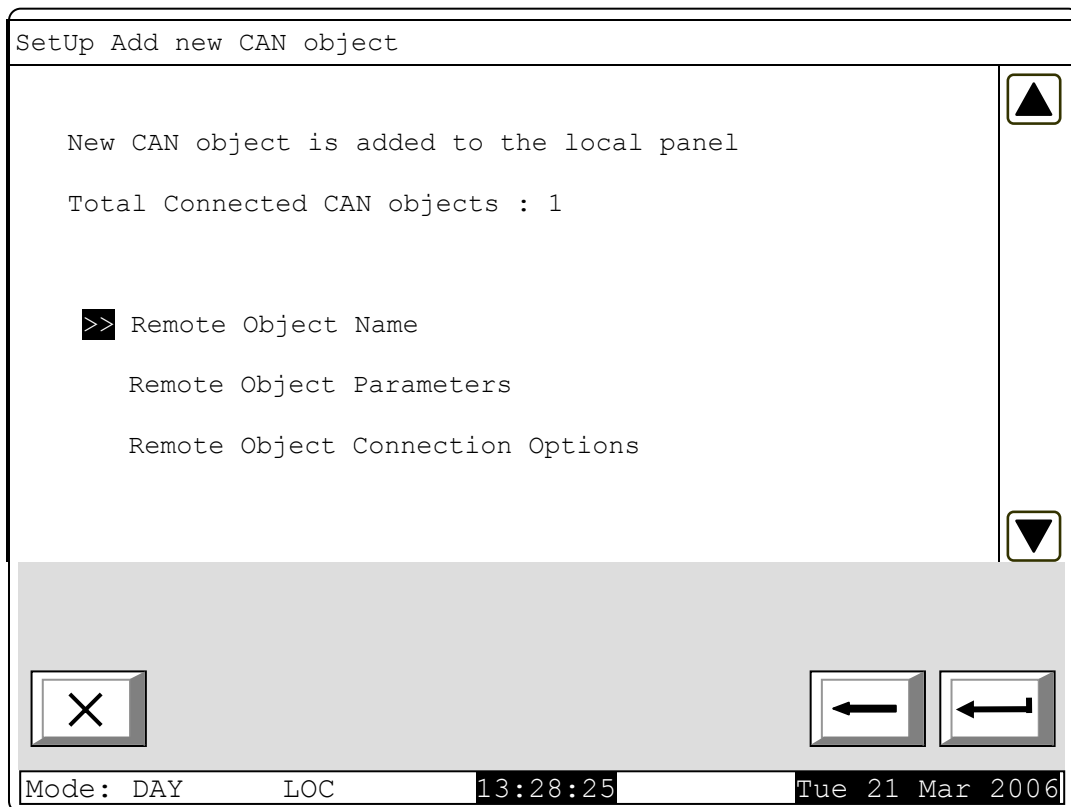
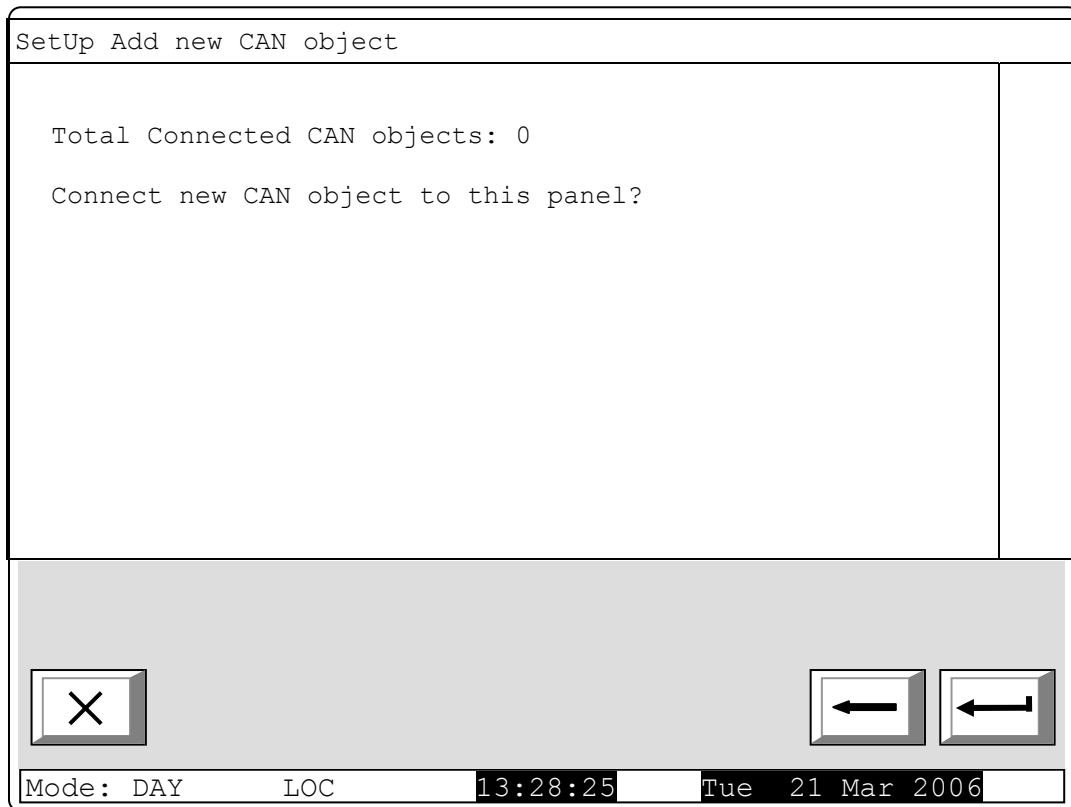
Connection of many objects (fire control panels for example) into a network calls for identification among them. That's why they shall have a unique sign. Typically, in a network it has to be a number. The number is formed through de-coding of a few parameters – name and address. The object's name is usually needed by the "human interface" – the user shall easily recognize the devices connected into the network. The next compulsory parameter is the address. It is the actual parameter used by the software for data exchange along the network. Upon configuration each device shall obtain a name and an address. In the IFS 7000 series the devices share a common address area. The maximum number of UniPOS fire control panels connected to a CAN is 32. The name is important to the user only and an object with a local name, when added to the list of local objects, may receive another name, suitable according to the user.

After the local network parameters are configured, it is necessary to select which objects will the local object operate with, and which desired options will be configured by the user upon data exchange. For the purpose use the menu for adding and object. To use the option, other devices shall have been previously physically connected to other devices in the CAN. For their proper functioning and exchange the devices shall have their local parameters previously configured.

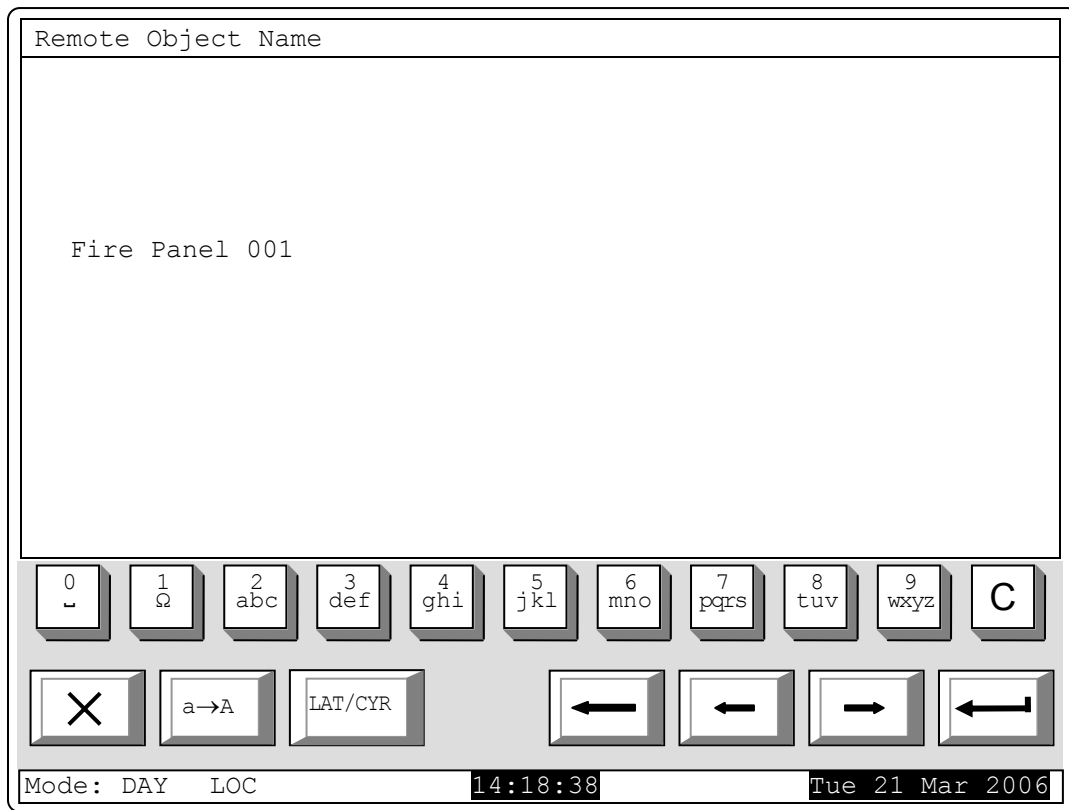
The next menu allows to add a CAN object, which the local fire control panel will control and will exchange data with.



The menu for adding a CAN object has the following appearance:

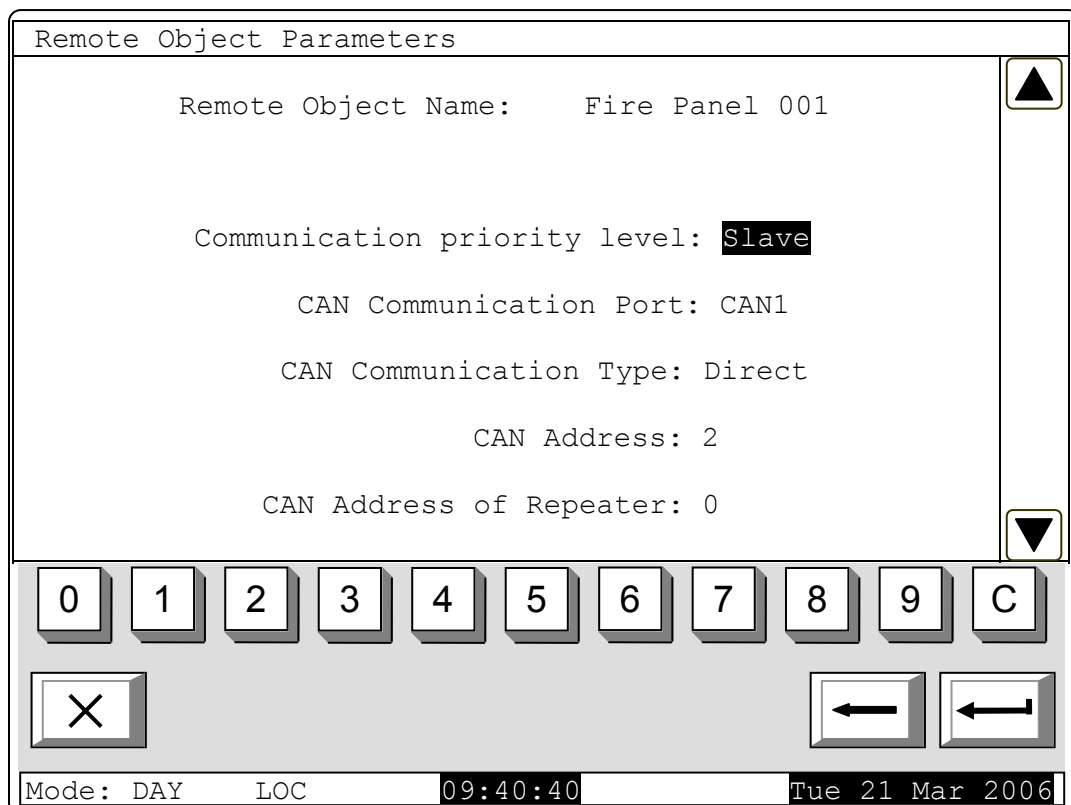
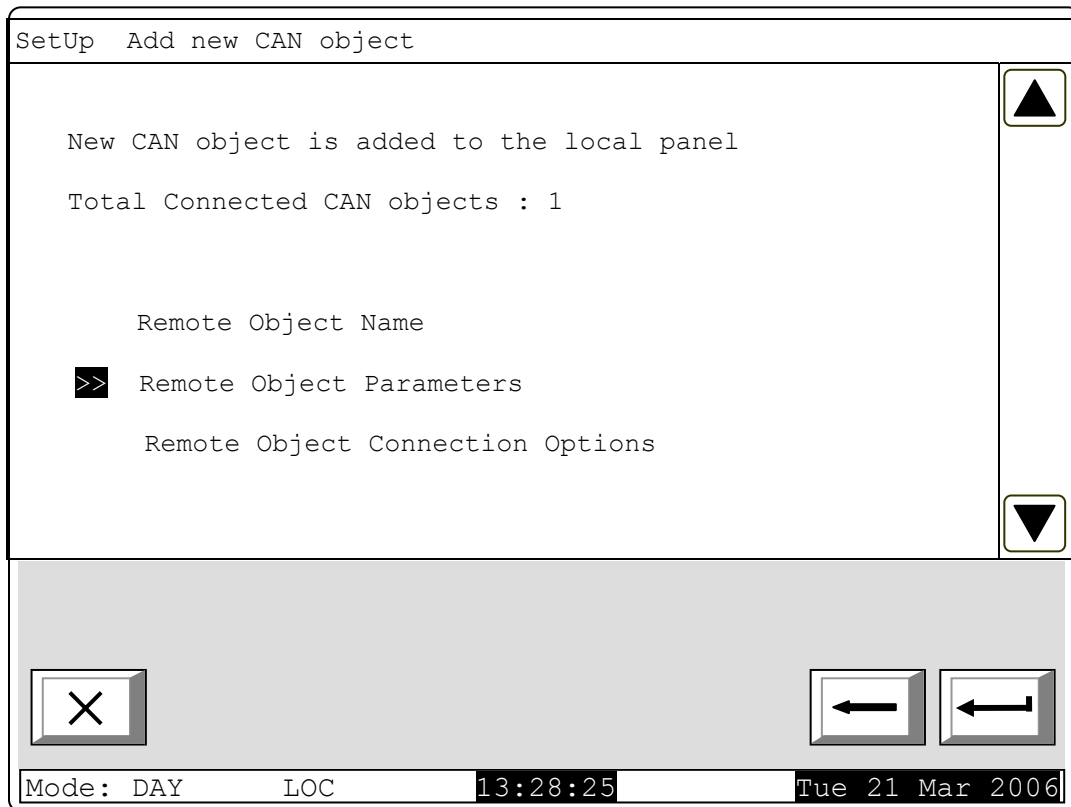


A name of the remote object can be assigned using the menu displayed above. The name is a random one (up to 20 symbols) and is not mandatory the same name given in the local parameters of the remote object.



Be advised, that by entering menu, you actually add automatically the last object to the list of connected objects. Therefore, the menu shall be accessed only when you add a new object.

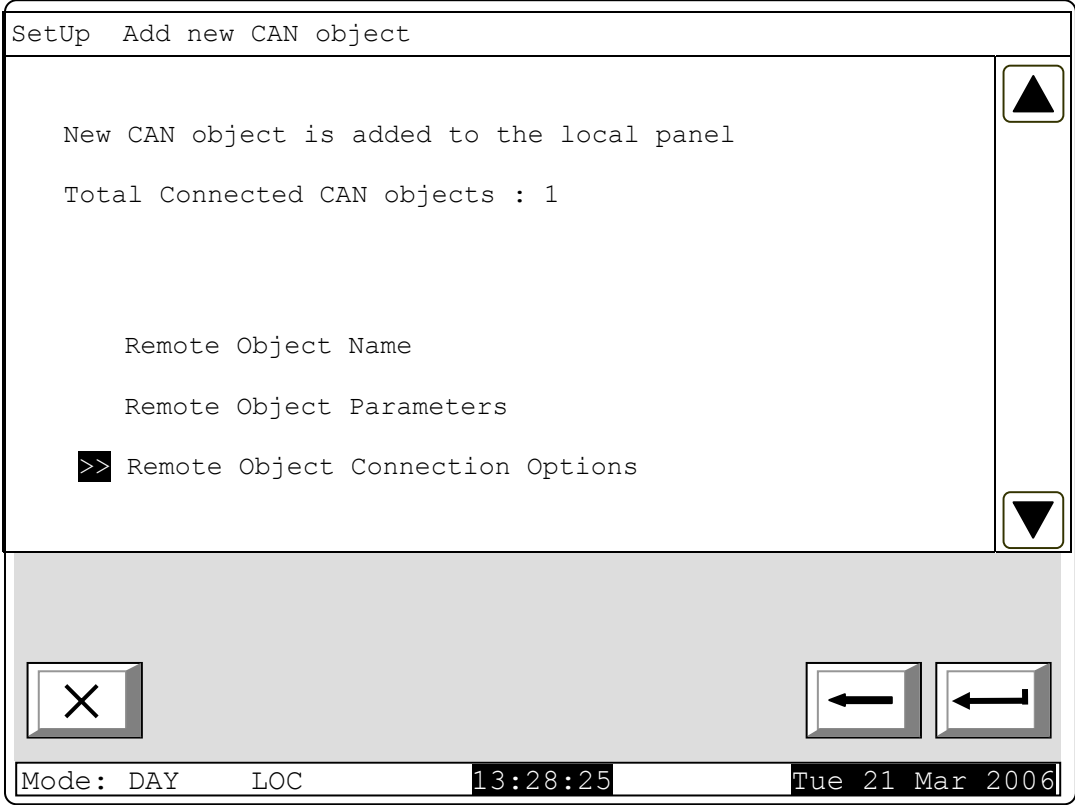
After a name has been given to the connected object, go back to the main menu and select the option for parameter adjustment of the newly added object:



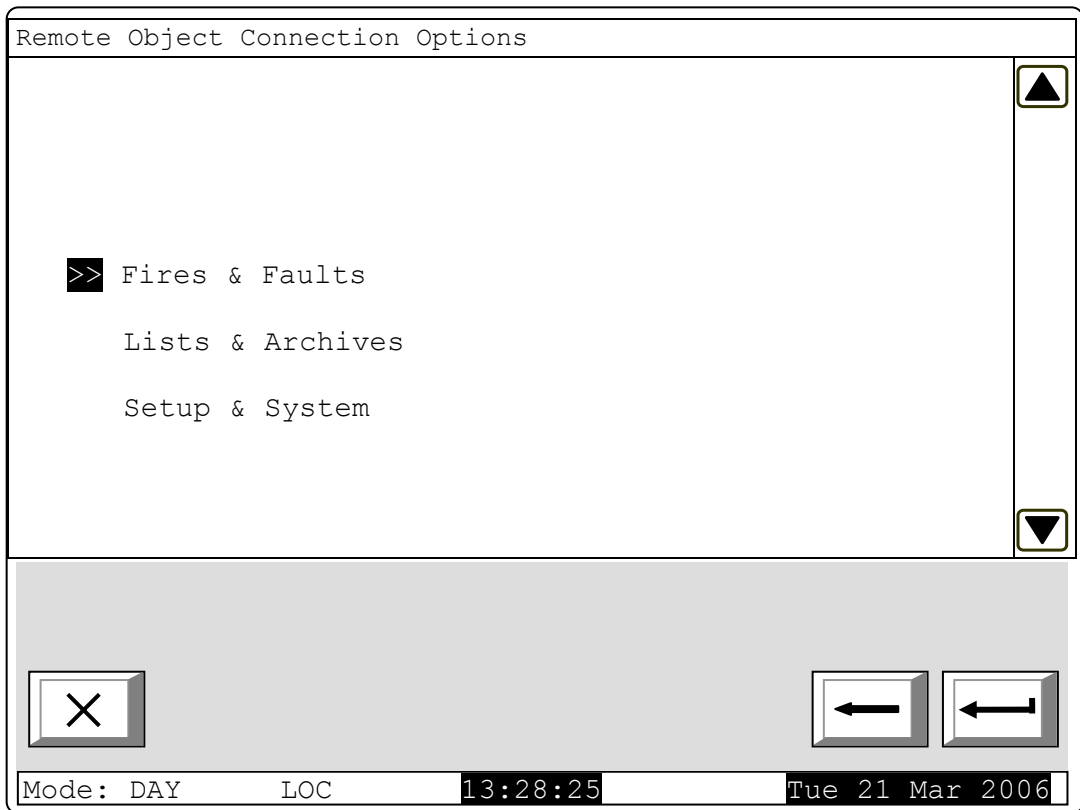
In this menu corrections can be made to an existing CAN object. The field *Communication Priority Level* defines the position of the described remote object (fire control panel) in the network – *Master* or *Slave*. The field *CAN Communication port* defines the port where the object is connected to. The connection type defines the means of the connection. In case of direct connection, the objects are assigned to one and the same CAN, in the address field of the

repeater the default value is 0. In case of connection of CAN 1 and CAN2 objects, the address of the relevant control panel shall be defined. Also, the connection type shall be changed, in **CAN Communication port: Via repeater**. Repeater's address shall be set too – as a CAN address of an object –repeater. The repeater object shall be described as an object assigned to the CAN, to the local control panel.

To use the control panel as a repeater, it shall be configured for a connection with the control panels that will use it as a repeater.

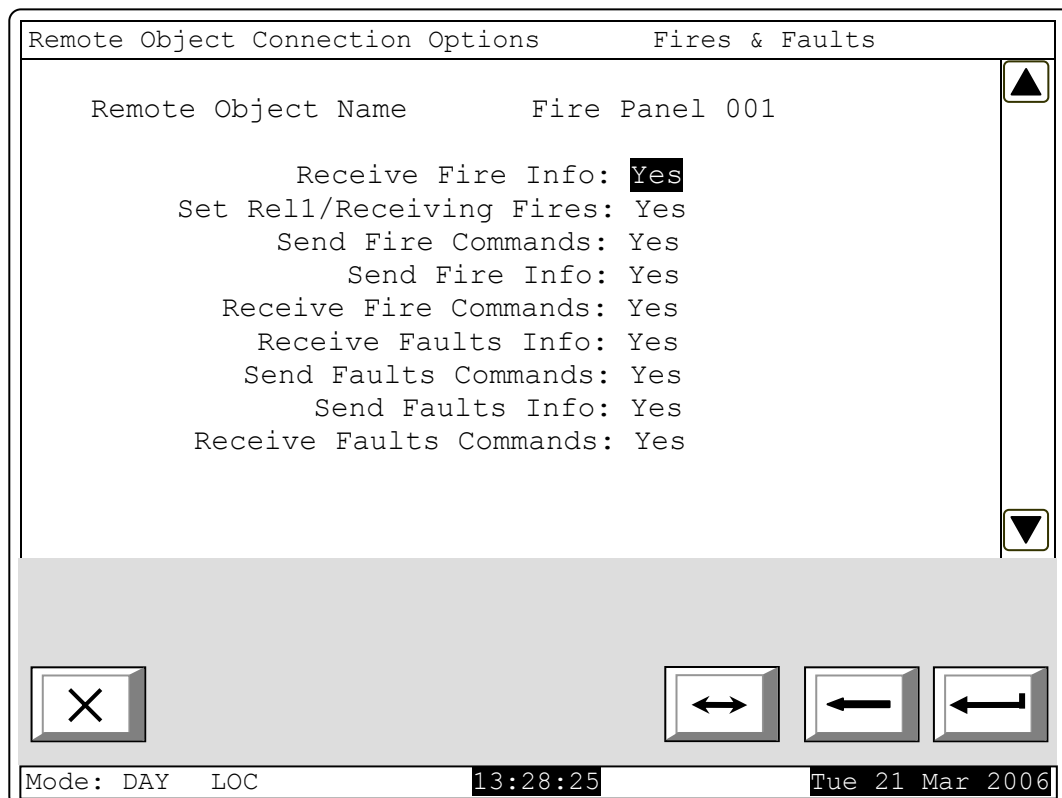


The communication options are displayed from the following submenu:

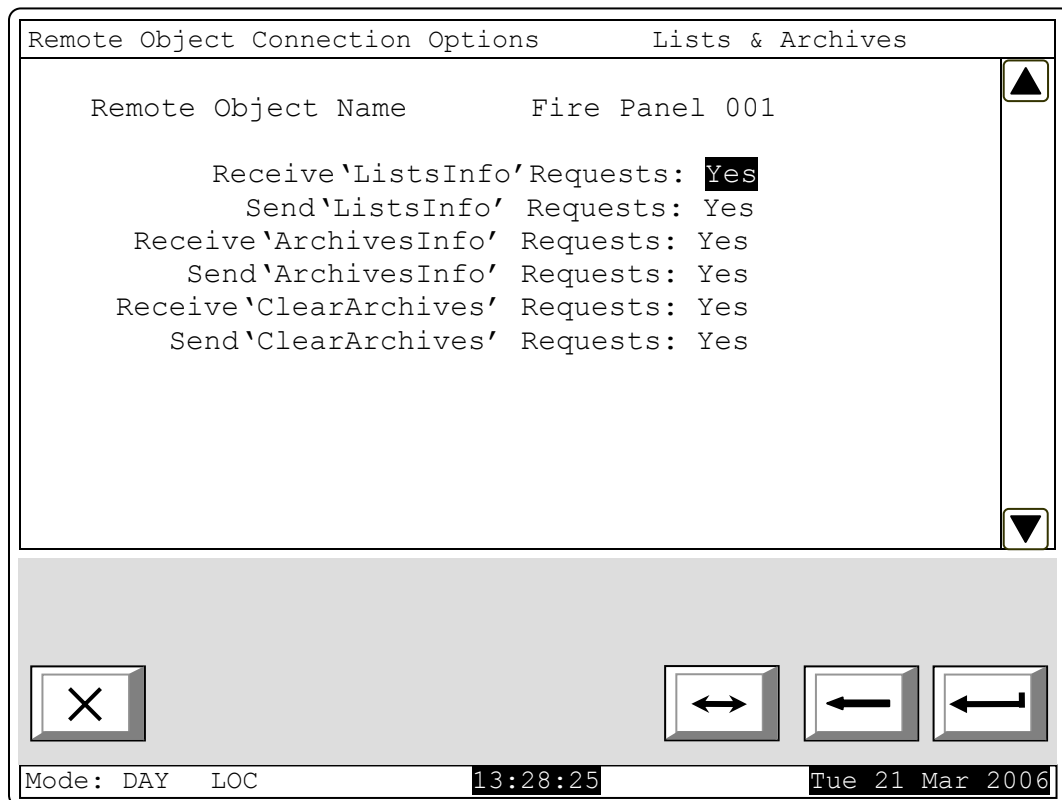
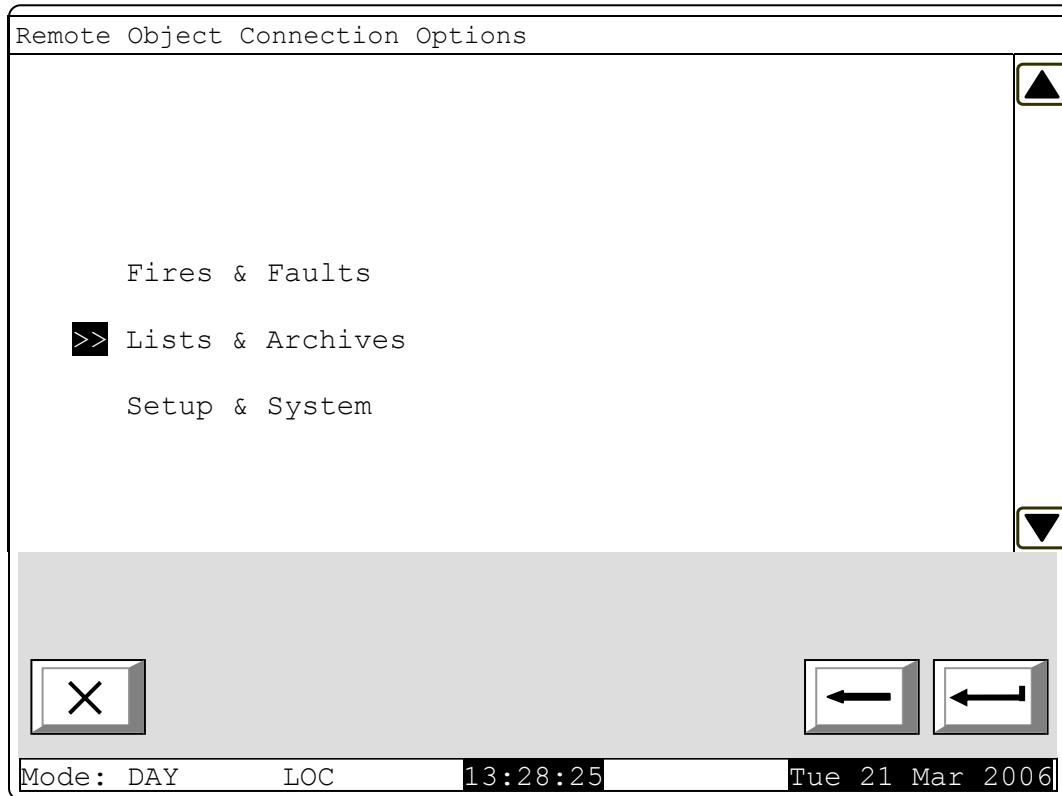


The menu above allows selecting a functionality setting of the fire control panel and the real data exchanged between all networked control panels.

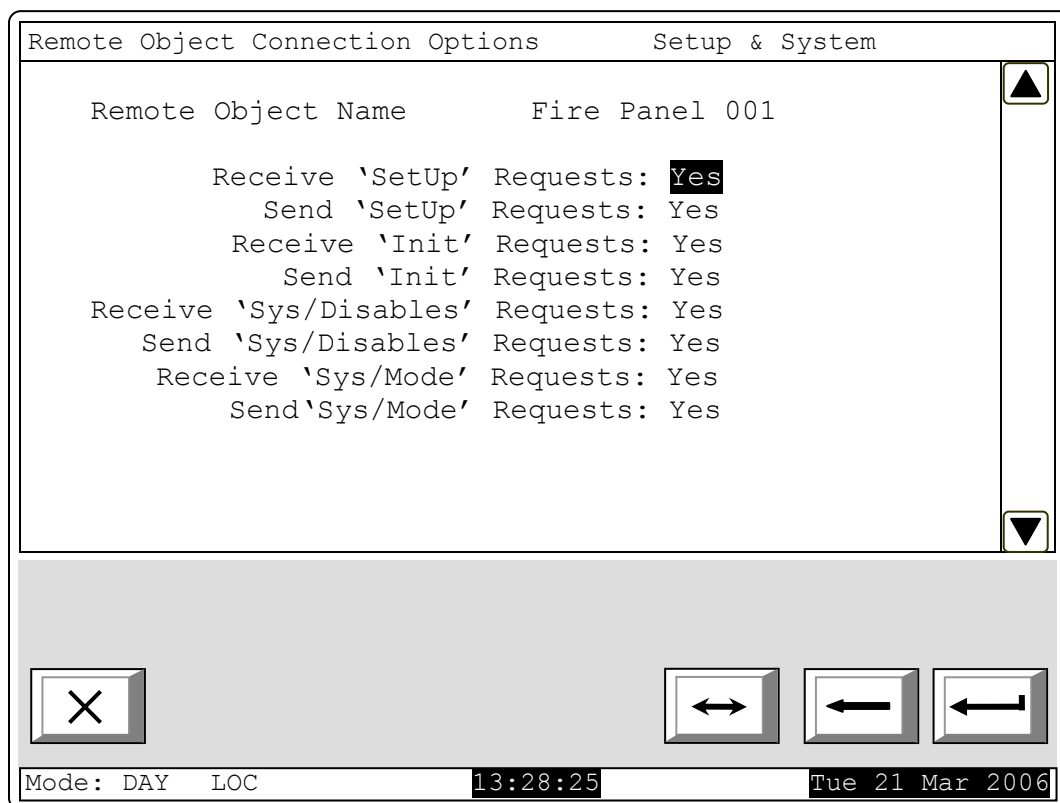
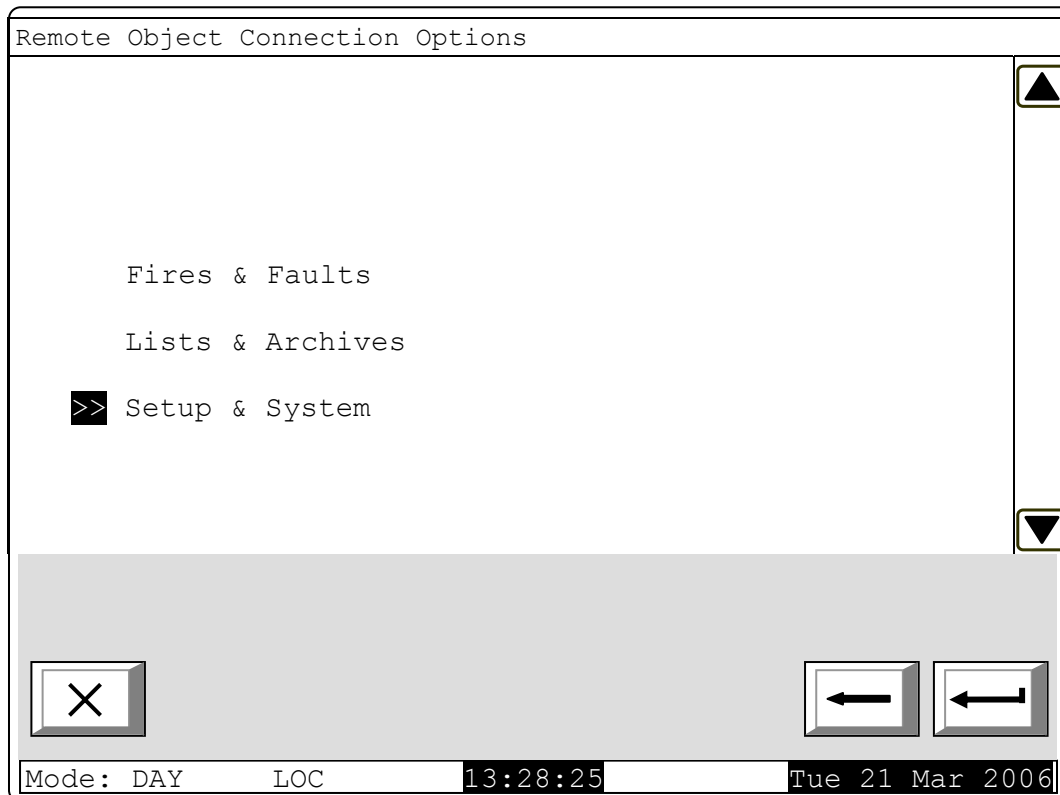
Fires & Faults menu:



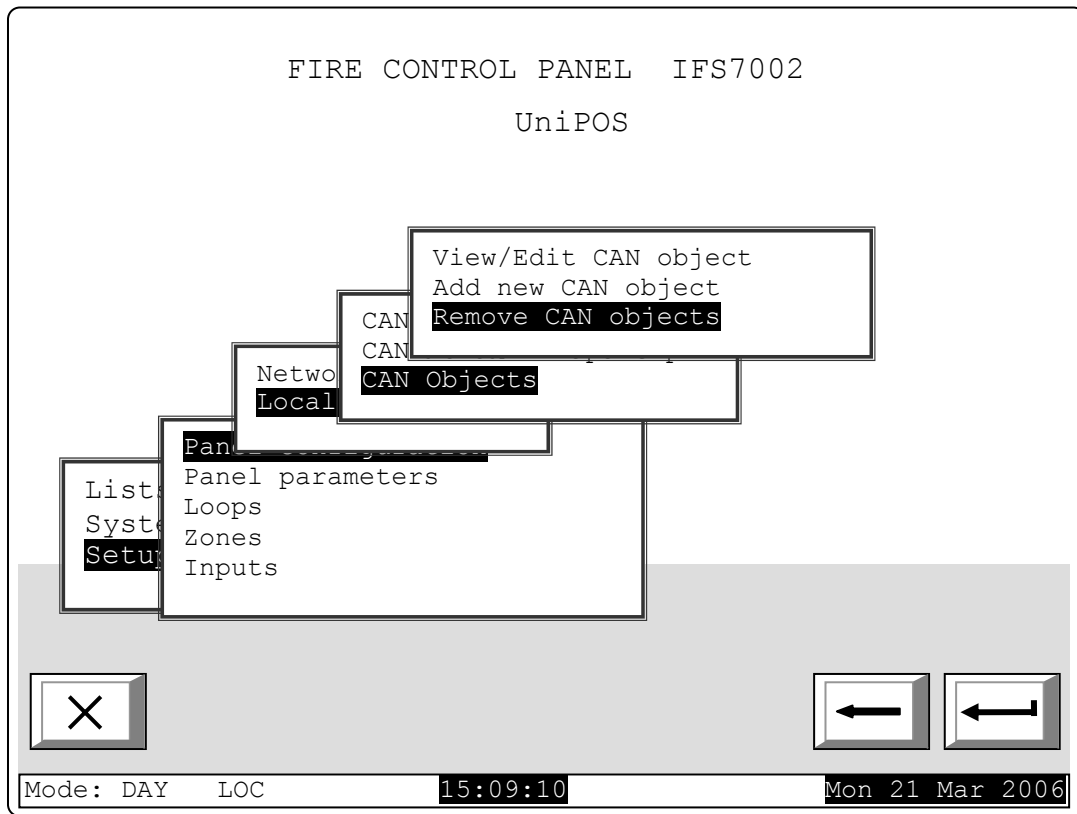
Menu *Lists & Archives* is displayed by retrieving the main submenu:



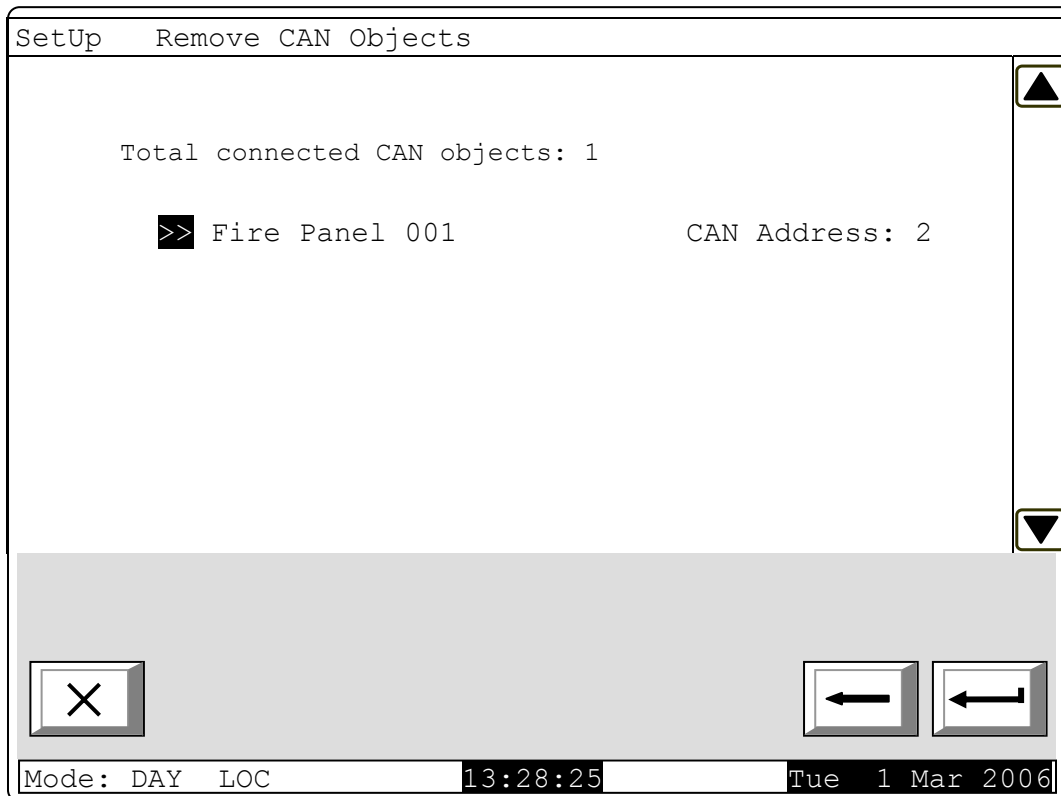
Setup & Systems menu can be displayed again by moving back to the main submenu:



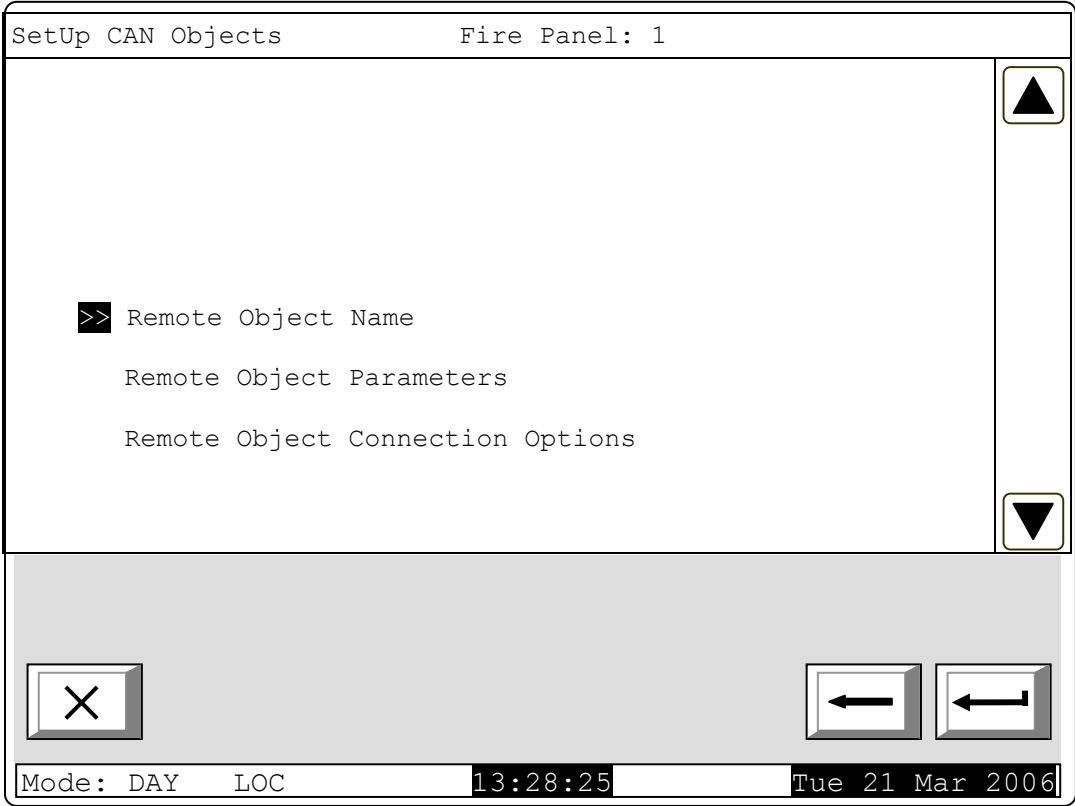
To remove added object (s):



Select the option *Remove CAN object* to display the list of all connected CAN objects:



The menu above contains information for connected objects. Scroll down to select the desired object for configuration:



Examples for development of a CAN

Development of networks of connected devices may sometimes become a serious challenge for the designers. Typically, the sites have a complex structure and a versatile logic. Therefore a profound research of the network abilities and functions of fire alarm system IFS7002 is requested in order to guarantee development of systems that function properly and reliably. To read the present appendix you shall be previously acquainted with the menus of the fire control panel. Afterwards you easily and quickly will configure your system.

General features and considerations relevant to development of fire alarm networks based on IFS7002:

IFS7002 allows connection of up to 32 devices in a network. In case of remote objects repeaters can be used, provided in each control panel as an option.

The basic parameters that shall be configured in each control panel are displayed in the next figures. It would be useful to know, that when giving a name of a control panel, up to 20 symbols shall be used.

When using repeaters from object to another one, a maximum of 32 objects is allowed.

Another specific feature is that in the developed network an arbiter that controls the data stream and the priorities upon communication between control panels is available. This feature allows construction of durable IFS7002 CANs. Practically, each fire control panel may be configured as an arbiter (i.e. Master).

All other panels in the CAN under development shall be mandatory configured as Slave.

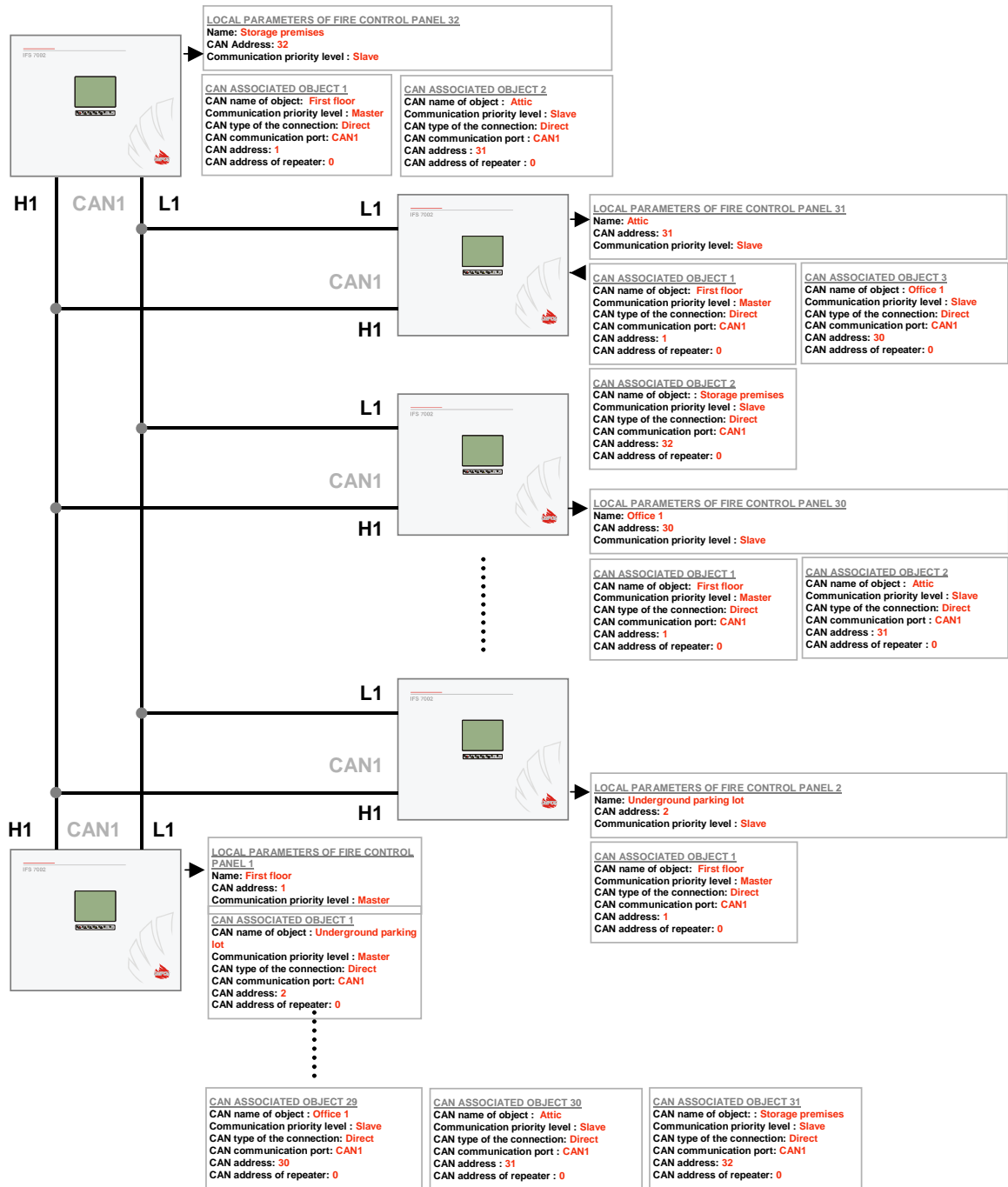
Another important term is "Connected Object". To make possible the remote communication with other control panels in the network, the parameters of the desired objects shall be manually entered.

Another specific is that the fire control panel, configured as a Master shall "see" all other control panels and in their configuration is shall be defined to "see" the Master control panel.

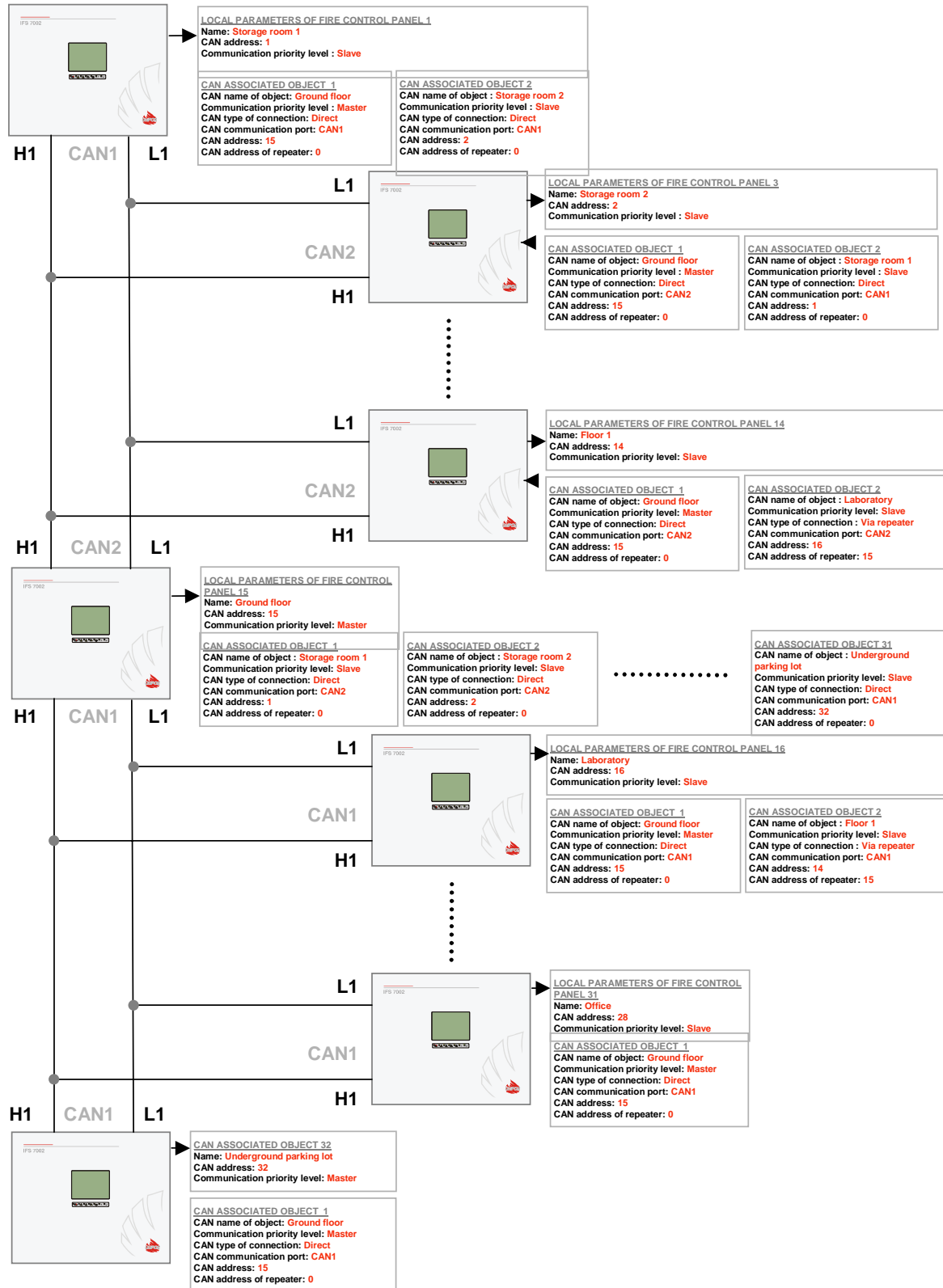
When control panels communicate without repeater, it is mandatory to select Repeater address: 0 and Connection type: Direct (as displayed in the examples).

When repeater is used, the CAN address of the repeater shall be defined, and the type of the connection shall be *Via repeater*.

CAN network with simplified connection without repeater



CAN network – connection with general master/repeater



CAN network – connection with separated master/repeater

