FMZ3 control panels

FMZ3 control panels use analog technology and a modular design based on easily removable plug-in boards. Function boards are available to implement all possible functional requirements even in the most complex fire detection and automatic extinguishing systems. Function boards simply plug in to a motherboard, so that the control panel can be quickly and easily expanded at any time. Many types of function board can even be configured to handle different types of sub-system.

The main purpose of FMZ3 control panels is to provide automatic fire detection and extinguishing functions. Nevertheless, FMZ3 control panels can also be used to control anti-intruder systems based on indoor and outdoor perimeter sensors, volumetric sensors, vibration detectors, and contact sensors, etc.. FMZ3 control panels use VDS standard current control technology to supervise incoming sensor and detection lines and outgoing actuator, fire extinguishing, and peripheral device control lines. FMZ3 control panels can control all the auxiliary functions typically associated with fire extinguishing systems, including the illumination of warning and escape panels, the activation of warning sirens, the local and remote display of alarm sensor status, and the synoptic display of normal or error system and line status. FMZ3 control panels can also use incoming alarm signals to control closed circuit TV (CCTV) systems, which can also be protected by anti-tamper supervision.

FMZ3 control panels are extremely modular in HW design, with the "daughter" function boards necessary for operation plugged directly into one or more motherboards. Terminal boards for lines to and from the field connect to the motherboard via flat cables. This cabling system entirely replaces traditional wiring and confers major advantages in terms of reliability and speed and ease of repair.

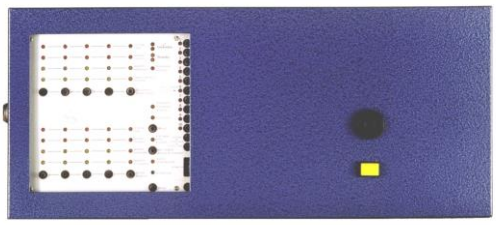
The FMZ3 series comprises two families of control panel:

- Metal wall mounted panels supporting 6/10/20 field lines;
- 19" rack based panels which are open for expansion through the installation of additional 20 line modules.

Rack based panels can be expanded as needed simply by adding further signal amplifier and power supply boards. The physical size of the system can therefore be increased to suit the number of lines it has to control.

FMZ3 control panels can also be used to drive repeaters and synoptic panels in hierarchical display systems in large buildings and building complexes.

System architecture



Caccialanza & C's FMZ3 control panels are housed in either compact, wall mounted cabinets or 19" industrial racks. While the compact, wall mounted cabinets are not expandable, rack based panels are open for expansion as required simply by adding more function and interface boards. Boards can be added at any time without interfering with existing system functions.

Compact control panels

There are three models of compact FMZ3 control panel:

- The FMZ3/6, capable of controlling up to 6 detection/extinguishing lines;
- The FMZ3/10, capable of controlling up to 10 detection/extinguishing lines;
- The FMZ3/20, capable of controlling up to 20 (10+10) detection/extinguishing lines.

Modular control panels

Modular panels are installed in 6 unit, 19" racks. Each line control board can handle up to 20 lines. Power supply boards, in 12 Vdc or 24 Vdc versions, are also installed in the rack. Power supply and line control boards can be installed in whatever number and combination is needed to satisfy system requirements. Inside the rack, the line control boards, power supply boards, and line terminal boards are interconnected using 20-wire or 40-wire flat cables. Terminal boards can be installed at the rear of the rack, in dedicated sections inside it, or even in separate terminal cabinets, connected to the main panel by flat cables. FMZ3 racks can also house other security system control devices like CCTV video crossbars, field device power supplies, and LED or synoptic panels for displaying sensor status.

Field devices can be powered via relay boards installed in the rack: relay boards are controlled via flat cables by function boards also installed in the rack. Field devices can also be driven by dedicated line control boards which provide permanent current control for the lines the connect. This latter type of interface is typically used to control extinguisher solenoid valves, warning sirens, and other devices of fundamental importance to security. FMZ3 control panels can also control auxiliary devices within integrated security systems. More shall be said about these devices later.

Boards

FMZ3 control panels can house a variable number of modular boards, either plugged directly one into the other or interconnected via flat cables.

The following types of board can be installed:

- Motherboards: These are the boards into which individual function boards are plugged.
- Function boards: These perform specific system functions.
- Power supply boards.
- Interface and auxiliary boards.

Motherboards

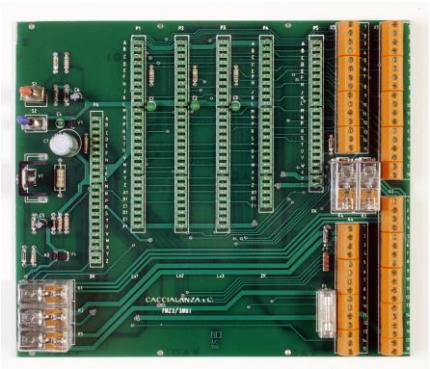
There are various types of motherboard, designed for either compact or rack based panels. FMZ3/6 six line compact panels include just one 3M6I motherboard, while the 10 line and 10+10 line compact panels contain 2 different motherboards, one 3MA10I which performs power supply functions, and one 3ML10I which performs line control functions. In rack based panels 3ML20I motherboards house the individual function or line control boards while 3MASI motherboards provide system power and 3MAUI motherboards provide power for auxiliary devices. The number of 3MAUI boards installed in each panel depends on the configuration and the number of auxiliaries dependent on it.

Following are the different types:

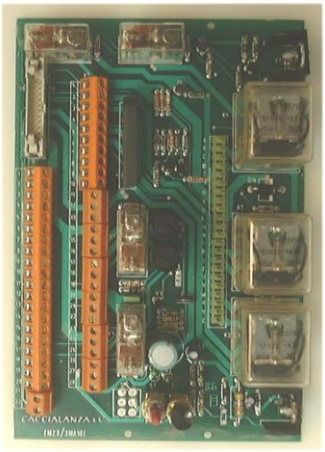
Part Number	Description	Layout Nr.	View Nr.
3193153509	FMZ3/M6I	31049356	BF3M0600
3193153109	FMZ3/MA10I	31049316	BF3MA100
3193154009	FMZ3/MASI	31049406	BF3MAS00
3193154109	FMZ3/MAUI	31049416	BF3MAU00
3193153209	FMZ3ML10I/	31049326	BF3ML100
3193153309	FMZ3/ML20I	31049336	BF3ML200

3M6I motherboard

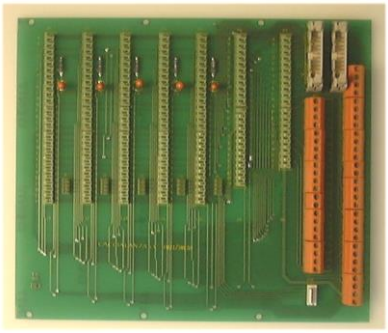
This type of motherboard is installed in compact, 6 line panels. It carries sockets for plugging in one 3BKI final power stage board, one 3ZKI main function board, and up to 3 3LxxI dual line control boards of whatever type needed. The 3M6I motherboard also carries field line terminals capable of connecting wires of up to 2.5 mm2 in cross section.



3MA10I base power stage motherboard



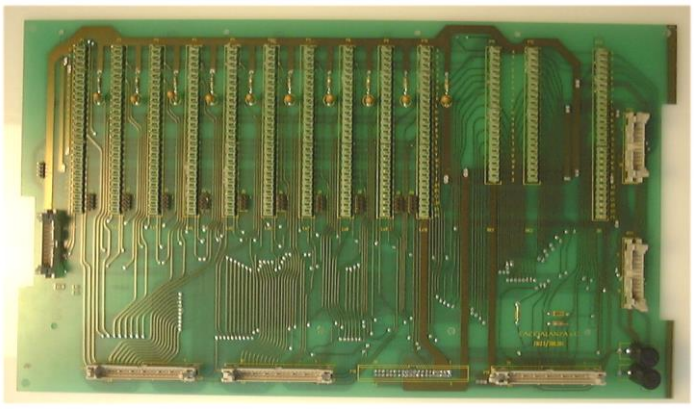
This type of motherboard serves as base power stage board in compact 10 and 10+10 line control panels. It carries a socket for plugging in one 3BKI final power stage board, and all the circuitry necessary to automatically switch in the 24 V extinguishing devices in an emergency condition. The 3MA10I motherboard also provides power and relay terminals (for fire and alarm devices and malfunction signals) capable of connecting wires of up to 2.5 mm2 in cross section. The 3MA10I board connects to the 3ML10I line control motherboard via a flat cable.



3ML10I line control motherboard

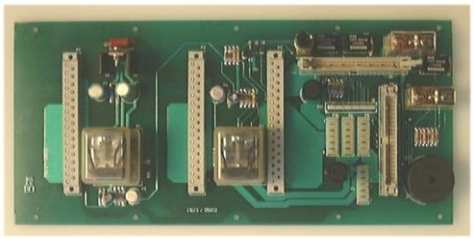
This type of motherboard is designed to house the line control and function boards in compact control panels. One 3ML10I motherboard is needed in FMZ3/10 panels: two are needed in FMZ3/10+10 panels. The 3ML10I motherboard can support up to five 3LxxI dual line control boards. It also provides field line connection terminals, and flat cable connectors for connection to the 3MA10I base power stage motherboard and to a second 3ML10I line control motherboard in FMZ3/10+10 panels. The 3ML10I motherboard also carries slots for a 3ZKI main function board and a 3RKI or 3RKBI line connection and test board.

3ML20I line control motherboard



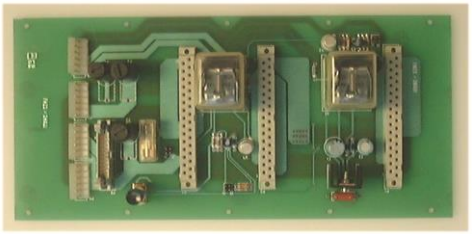
This type of motherboard houses the line control and function boards in 19" rack panels. The number of function boards installed in it obviously depends on the configuration of the panel and the performance required. More than one 3ML20I motherboard can be installed in each control panel, and connections between one 3ML20I board and its peers and final power stage motherboards are made via flat cables. Flat cable connections are also used to connect the 3ML20I motherboard to the input and output line terminal boards. Each 3ML20I motherboard can house up to ten 3LxxI dual line control boards, one 3ZKI main function board (or 3SZKI in sub-panels), and two 3RKI or 3RKBI line connection and test boards.

3MASI motherboard



This type of motherboard houses the primary power supply board in modular rack panels. It can house one or two 3BAI power supply boards and the associated 3BASI power control board. Connections to line control boards and other motherboards are made using flat cables. The 3MASI motherboard also carries a socket for connection, via flat cable, to the general function terminal board (for general relays, alarms, power failures, etc.). 3MASI motherboards operate constantly at 12 V.

3MAUI motherboard



This type of motherboard is designed to house additional power supply boards in rack based control panels. 3MAUI boards interface with the rack's 3MASI board. 3MAUI boards can house one or two 3BAI power supply boards and the associated 3BASI power control board. 3MAUI motherboards can be configured for 12 V or 24 V operation to suit the requirements of the power supply boards they house. More than one 3MAUI board can be installed in larger FMZ3 control panels to power additional field devices. The 3MAUI motherboard is connected with the other motherboards in the system by means of flat cables.

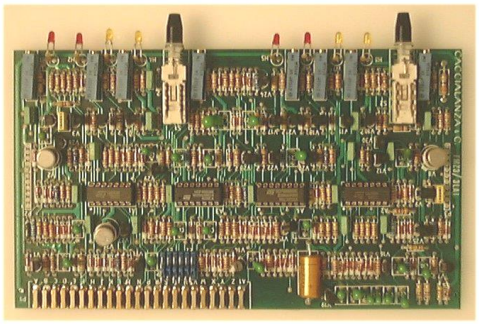
Function boards

These are the heart of the FMZ3 system and provide the individual functions required by the system. Function boards can be broadly subdivided into field signal acquisition boards, peripheral device control boards, and field device status supervision and/or display boards. 3LxxI line control boards can be installed in any arrangement in the slots provided for them in all types of control panel. The same board format is used in both compact and rack based control panels.

This is the list of the different boards:

Part Number	Description	Layout Nr.	View Nr.
3193150109	FMZ3/LAI	31049016	BF3LA000
3193150209	FMZ3/LEI	31049026	BF3LE200
3193150309	FMZ3/LE4I	31049036	BF3LE400
3193150409	FMZ3/LK	31049046	BF3LK200
3193150509	FMZ3/LK4	31049056	BF3LK400
3193150609	FMZ3/LOE	31049066	BF3LOE00
3193150719	FMZ3/LS2	31049086	BF3LS200
3193150709	FMZ3/LS4	31049076	BF3LS400
3193151209	FMZ3/RKI	31049126	BF3RK000
3193151309	FMZ3/RKBI	31049136	BF3RKB00
3193151009	FMZ3/ZKI	31049106	BF3ZK000
3193155119	FMZ3/SZKI	31049116	BF3SZK00

3LAI manual and automatic detector line control board



This is a dual line control board, designed to control two separate paired lines. Both lines are composed of a manual sensor line and an automatic sensor line. Automatic lines can be connected and disconnected by switches on the board itself while manual lines have to be connected and disconnected by switches on the 3RKI line connection and test board, described below. 3LAI boards provide power for the sensors and detectors they control and handle incoming signals over current controlled signal lines. 3LAI boards can recognise normal operating status, alarm status on one or more detector lines, and detector malfunction status (caused by a line breakage or short circuit or dirt on the detector device).

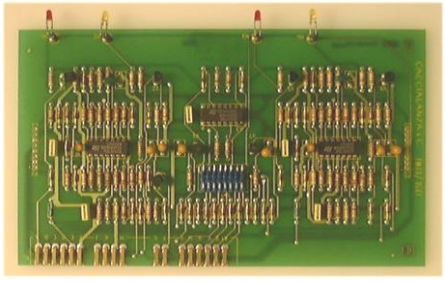
The 3LAI board is equipped with an on-board configuration DIP-switch. This can be used to configure the board so that the first line functions as an instant fire alarm line, or so that the first line functions as a pre-alarm line, and alarms as such require simultaneous signals from at least two sensors. The board can also be configured to generate an alarm only if both detection lines provide simultaneous alarm input signals.

The 3LAI board outputs alarm and malfunction signals for each line as well as general control signals. Automatic alarm, manual alarm, malfunction, and line status is shown by LED indicators.

When automatic fire detectors signal an alarm condition, the 3LAI board performs a triple interrogation procedure to ensure that there is a real fire and that the condition has not been caused by spurious electrical interference along the line. After the first alarm signal has been received, if the board ascertains that the alarm signal has indeed been generated by the detector, it

performs an automatic reset, and automatically disconnects and re-connects the active detector. If there is a real fire in the area, the same detector will immediately return another alarm signal as soon as it is reconnected. The board now interrogates the detector a third time. If an alarm signal is again returned, the board assumes that there is really an alarm condition in the area controlled. This triple interrogation sequence is completed in only 7 - 8 seconds.

3LEI line control board for manual detectors and detectors with built-in function check circuitry

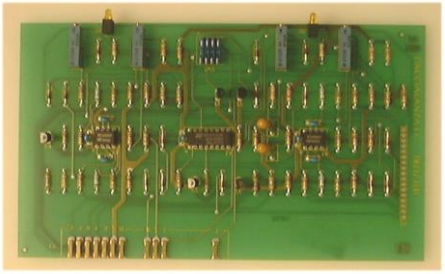


This type of line control board is used mainly to control anti-intruder lines. 3LEI boards are available in two versions, to control 2 or 4 lines independently. 3LEI boards perform all the functions of 3LAI boards with the exception of the triple interrogation procedure for eliminating false alarms, since this is not required with manual and self-testing sensors.

With the 2 line version, field lines are connected and disconnected via the 3RKI line connection and test board. The 4 line version the 3LEI board incorporates its own line connection push-buttons.

3LEI control boards provide power for the lines they control and handle incoming signals over current controlled signal lines. These boards can distinguish between normal operating status, alarm status, and malfunctions caused by line breakage or short circuit.

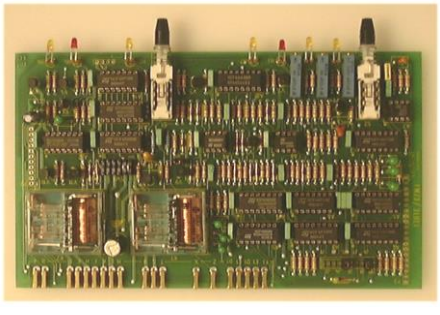
The 3LEI board also outputs alarm and malfunction signals as well as general control signals for the lines it controls (other than on 4 line versions, which do not provide individual malfunction signals). Line alarm and malfunction status is also shown by on-board LED indicators.



3LKI actuator line control board

This type of line control board is designed to supervise current controlled actuator lines. It is available in two versions to control 2 or 4 lines. The main function of the 3LKI board is to ensure the electrical continuity of warning and extinguishing device control lines so that functioning can be guaranteed in an emergency. 3LKI boards are typically used to supervise control lines for solenoid valves, warning sirens, etc.. The 3LKI board can also be used to supervise external alarm generation devices like pressure switches and cylinder discharge warning devices, etc.. The 3LKI board outputs only malfunction signals for the lines it controls.

3LOEI manual and automatic extinguishing system control board

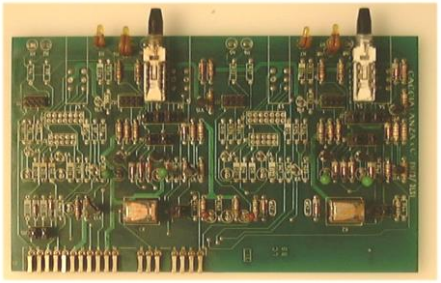


This type of board controls two lines, both of which must be associated with the same extinguishing zone. One line activates warning devices like sirens, etc., while the activates the actual extinguishing device (e.g. solenoid valve). The 3LOEI board also incorporates push-buttons for the connection, disconnection, and manual control of the lines. The board can be configured to start the extinguishing sequence on receipt of an alarm signal from a single detection

line, from two detection lines, or from two out of three associated lines. The duration of the pre-alarm period can also be varied between 0 and 90 seconds by means of on-board DIP switches. Extinguishing starts at the end of the pre-alarm period. The board can likewise be DIP-switch configured to provide intermittent (pulse) or continuous control signals to suit the type of extinguisher device.

3LOEI boards can directly display line malfunction conditions. Line malfunction signals can also be output in the same way as pre-alarm and device control signals.

3LSI line status display and push-button function control board

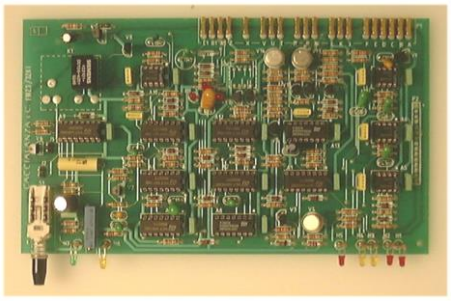


3LSI boards are available in 2 or 4 line versions. They accept an NO or NC continuous or pulse input from each controlled line. (Input types can be configured by means of on-board DIP switches.) Input signals are displayed by on-board LEDs and can also be relayed as outputs. Controlled lines are also subject to direct push-button control (complete with dedicated LED) to drive relays or actuators requiring standard control techniques.

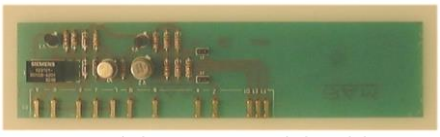
3ZKI main function board

This board supervises the main functions of the control panel. It outputs fire and malfunction detection signals and drives general purpose fire and malfunction linked relays. The 3ZKI board also generates the pulse form voltages which the control panel requires for signalling and automatic detector line interrogation.

The board can be configured to reset lines and control panel warning buzzers according to an independent and automatic time delay. It can also reset warning buzzers automatically as soon as malfunction conditions cease.

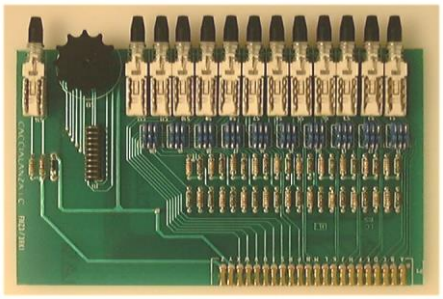


3SZKI signal amplifier board



This board amplifies the signals from 3ZKI boards in multi-module rack panels. The functions of this board cannot be controlled by or displayed to the operator: the board simply duplicates the functions of the main 3ZKI board in the main rack module. One 3SZKI signal amplifier board is required for each additional rack module after the main module containing the 3ZKI board.

3RKI line connection and test board



This board is designed to connect and disconnect the automatic and manual alarm lines controlled by the 3LAI and 3LEI boards (only in 2 line versions). An on-board switch also enables you to select individual lines and test the functioning of 3LAI, 3LEI, and 3LKI boards by simulating normal, malfunction, and alarm conditions in the field.

3RKBI by-pass board

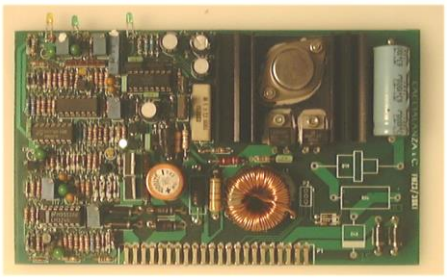
This is a passive board which simply takes the place of 3RKI boards in panels which do not require connection and test functions. The 3RKBI board has no inputs or outputs.

Power supply boards

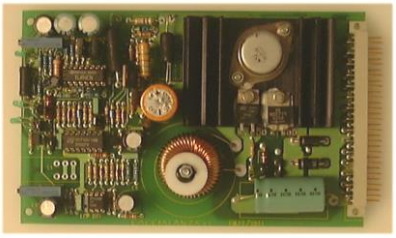
The power supply functions are performed in the system by the following boards:

Part Number	Description	Layout Nr.	View Nr.
3193152109	FMZ3/BAI-12	31049216	BF3BA100
3193152129	FMZ3/BAI-24	31049218	BF3BA200
3193152309	FMZ3/BASI-12	31049236	BF3BAS10
3193152319	FMZ3/BASI-24	31049238	BF3BAS20
3193152209	FMZ3/BKI	31049226	BF3BK000
3193152509	FMZ3/N1I	39043216	BF3N1000
3193152609	FMZ3/N4I	39042240	BF3N4000
3195006409	FMZ3/915	39043936	BF391500

3BKI final power stage board for compact panels



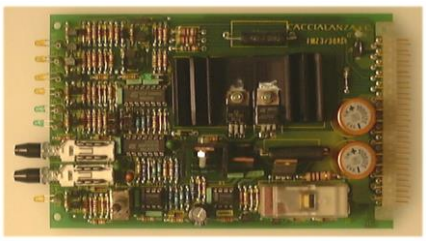
This type of board provides final power stage functions for compact FMZ3 control panels. It receives low voltage AC power directly from the mains transformer and generates the 12/24 V stabilised voltages required by the system. The 3BKI also charges the backup batteries and switches them in during mains power failures. The board incorporates normal functioning, board malfunction, battery malfunction, and power failure status LEDs.



3BAI final power stage board for rack panels

This type of power supply board is used in FMZ3 rack control panels. It can deliver up to 8A 12V, or up to 4A 24V. The 3BAI board receives low voltage AC power from the mains transformer and generates the regulated voltage required to keep the backup batteries charged. The board incorporates normal functioning and power malfunction status LEDs.

3BASI power control board



This board is installed in rack systems to control 3BAI boards. Each 3BASI board can simultaneously control up to two 3BAI boards. The 3BASI board provides the connections for the system's backup batteries which are charged under the control of the 3BAI board. The 3BASI board also incorporates active circuitry to disconnect the backup batteries if they are fully run down in order to prevent damage. The board performs a periodic test on battery condition and displays battery malfunction status.

3NI mains power interface board

The 3NI board is designed to connect devices requiring 230V 50Hz power (max. 2A) to the mains supply. It incorporates a mains filtre and protective fuse for this purpose. The 3NI board delivers mains power to the primary windings of the AC ring transformer which supplies the individual power supply boards. The terminals of the 3NI board can connect wires of up to 2.5 mm2 in cross section.

3N4I mains power interface board

As for the 3NI but capable of connecting up to four 230V 50Hz power users and delivering a total current of up to 4A. The 3N4I board is used in the same way as the 3NI board but can connect to more power users.

3/9151 DC/DC converter board

This DC/DC converter board transforms the +12V supply into -12V to power sensors requiring a differential potential of over 12V.

Interface and auxiliary boards

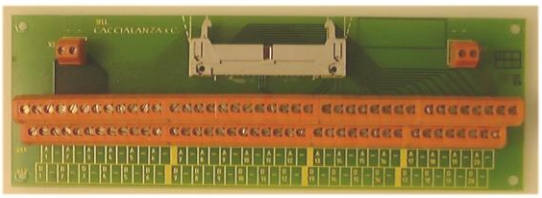
Interface boards connect up the lines coming in from the field, those going out to the field, and the serial communication lines. Auxiliary boards on the other hand perform the specific functions needed for particular operations.

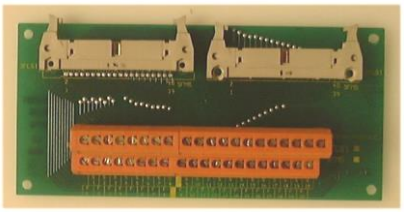
This is the actual list:

Part Number	Description	Layout Nr.	View Nr.
3193155309	FMZ3/FAI	31049536	BF3FA000
3193155109	FMZ3/FLLI	31049517	BF3FLL00
3193155119	FMZ3/FLL2I	31049516	BF3FLL20
3193155209	FMZ3/FLSI	31049526	BF3FLS00
3193156009	FMZ3/LEDA	31049606	BF3LEDA0
3193155809	FMZ3/STKI	31049586	BF3STK00
3193155709	FMZ3/SKRI	31049576	BF3SKR00
4640010909	FMZ3/SLRI	46190906	BF3SLR00
3193155909	FMZ3/SMEI	31049596	BF3SME00
3193155509	FMZ3/SMRI	31049556	BF3SMR00
3193155609	FMZ3/SMSI	31049566	BF3SMS00
3193155809	FMZ3/SKKI	31049589	BF3SKK00

3FLI terminal board

This type of terminal board is designed to connect detection lines coming in from the field. It can be equipped with a 3/915I DC/DC converter board to drive devices requiring voltages over 12V. The 3FLI board is connected to the motherboard via a flat cable. Its terminals can connect wires of up to 2.5 mm2 in cross section.



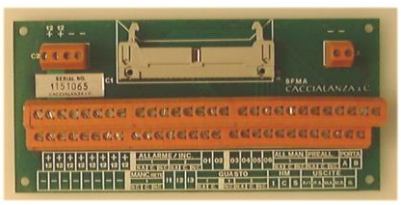


3FLSI terminal board

This type of terminal board provides output connections for display and control signals generated by the FMZ3 control panel after fire, intruder, or malfunction alarms. 3FLSI boards do not insulate their outputs from the system. One of their main uses is to drive LED repeater panels.

3FAI terminal board

This type of terminal board provides general control output connections (for relays, auxiliary power supplies, etc.). These outputs are not insulated from the system other than by one or two switch contacts.

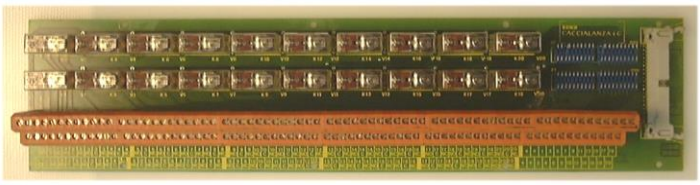


3SKRI relay board

This board carries 6 relays which can be tripped by alarm or malfunction signals from the control panel. Each relay has two switching contacts.

3SMRI relay board

This is a 20 relay board. Each relay has two switching contacts and can be operated by alarm and malfunction signals from the control panel.

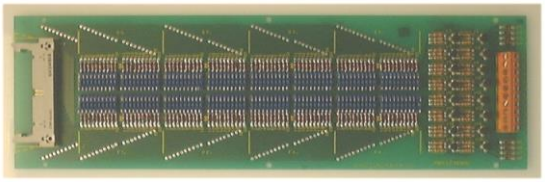


3SLRI power relay board

This is a power relay board designed to provide direct mains power. It is fitted with 6 single contact relays capable of carrying currents of up to 4A, 230V. Each contact is protected by its own fuse. The board can power up to 6 devices at user programmable voltages up to 230V.

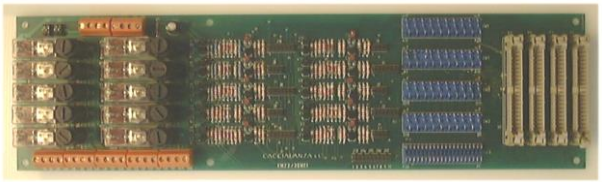
3SMSI signal encoding board

This board uses alarm and malfunction signals from the control panel to provide logic AND and OR gates.



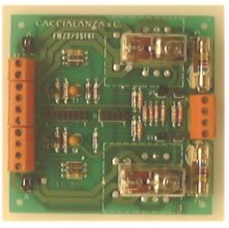
3SMEI actuator control board

This type of board is designed to power and control actuators, and particularly fire extinguishing devices, in the field. It interfaces with 3LKI or 3LOEI boards for line control functions and with 3LAI or 3LOEI boards for actuator control functions and, in conjunction with these boards, provides pre-alarm and extinguishing alarm functions. Each actuator line is fused, and the board also returns fuse and power status signals to the control panel. 3SMEI boards can drive 10+10 lines complete with pre-alarm and alarm functions.

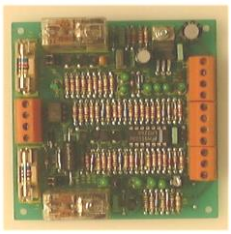


3STKI actuator control board

This type of board is designed to power and control actuators, and particularly fire extinguishing devices, in the field. It interfaces with 3LKI or 3LOEI boards for line control functions and with 3LAI or 3LOEI boards for actuator control functions and, in conjunction with these boards, provides pre-alarm and extinguishing alarm functions. 3STKI boards can drive 1+1 lines complete with pre-alarm and alarm functions.



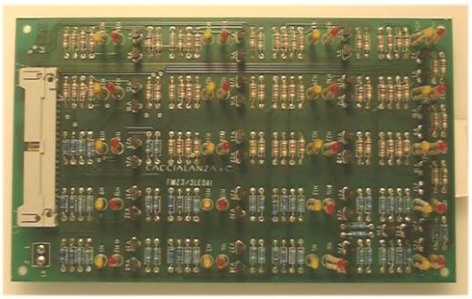
3SKKI actuator control board



This type of board is designed to power and control actuators and fire extinguishing devices where pre-alarm warnings must be given before the extinguishing agent is discharged. (The 3SKKI board is commonly used with CO2 extinguishing systems.) Like the 3STKI board, the 3SKKI board interfaces with 3LOEI line control boards to provide detection and activation functions for pre-alarms warnings and the extinguishing phase itself.

3LEDAI LED display board

This LED display board is designed to display alarm statuses, particularly for remote auxiliaries. It can also be used to repeat alarm and malfunction signals output from the control panel via the 3FLSI board.



Other system components

Badge reader systems like the MKL3 can be interfaced with FMZ3 control panels to provide information on badge reader tampering, unauthorised use of accesses, open doors, etc.. The systems can be interfaced on two levels: either the peripheral badge readers themselves or the MKL3 control panel can be connected to the FMZ3 control panel.

Personnel timekeeping data and timekeeping errors acquired by the MKL3 control panel are not shared with the FMZ3 security system control panel, but badge reader alarm conditions can be transmitted to the FMZ3 control panel via 3LSI boards.

Host computers can also be interfaced with the FMZ3 control panel to provide a user friendly display of installation status and to automatically generate logs for normal and alarm events. Host computers require hard disks and colour graphic monitors to perform these functions. A printer can be added as an option. The main screen of the integrated security application program constantly displays all alarm conditions and alarm-related events, but operators can also display normal operating events on request. The software can be customised to display maps of the building or building complex protected by the FMZ3 system, showing the distribution and status of security system lines and devices. The software also allows the operator to acknowledge alarms, log and annotate them, and reset them after the cause has been eliminated, again with event logging if required.

System expansions

Additional alarm repeater stations can be constructed using standard 3LEDAI LED status display boards driven from the outputs of the main FMZ3 control panel, or using customised LED panels wired to a suitable FMZ3 terminal board.