MULTISCAN++/S2-16

ATEX and SIL 2 certified

INSTALLATION AND USE MANUAL

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Warning

THIS MANUAL MUST BE CAREFULLY READ BY ALL PERSONS WHO HAVE OR WILL HAVE THE RESPONSIBILITY FOR INSTALLING, USING OR SERVICING THIS PRODUCT.

Like any equipment, this product will perform as designed only if installed, used and serviced in accordance with the manufacturer's instructions. OTHERWISE, IT COULD FAIL TO PERFORM AS DESIGNED AND PERSONS WHO RELY ON THIS PRODUCT FOR THEIR SAFETY COULD SUFFER SEVERE PERSONAL INJURY OR DEATH.

The warranties made by Sensitron s.r.l. with respect to this product are voided if the product is not installed, used and serviced in accordance with the instructions in this user guide. Please protect yourself and others by following them.

We recommend our customers to write or call regarding this equipment prior to use or for any additional information relative to use or repair.

THIS TECHNICAL MANUAL DESCRIBES THE PRODUCT IN ITS COMPONENTS, THE INSTALLATION AND THE OPERATION OF THE SYSTEM. THE CONFIGURATION SOFTWARE IS NOT INCLUDED, SO PLEASE REFER TO THE PROPER MANUAL.

INDEX

1) INTRODUCTION

The **MULTISCAN++S2/16** is a gas control unit designed to offer the widest range of flexibility required by the market.
The control panel is based on a powerful microprocessor which provides a wide range of self-diagnostic procedures to detect and locate possible faults.
Extremely flexible and reliable, it can manage up to 24 detectors, 8 directly connectable to the panel and 16 gas detectors on the 2 serial lines the panel comes complete with.
The detectors can be either of addressable type, directly connected on buses, or 4-20mA analogical types connected via 8-input STG/IN8-S remote modules.
System architecture also includes 6 on-board relays and the possibility to expand outputs up to 32 using remote STG/OUT16-S modules and 8-relay boards.
Three alarm thresholds to be set for each detector. The alarm threshold activation mode changes according to the type of gas detection profile chosen and the detectors connected.
The unit is housed in a plastic box complete with 27 Vdc 4 A power supply.

Summary table of the devices that can be connected to the various **MULTISCAN++S2/16** unit versions.

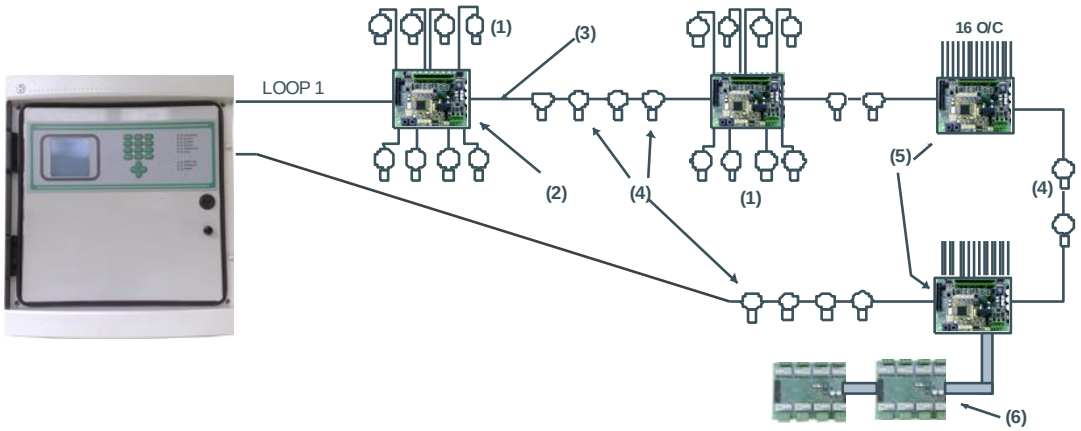
Panel type	Number of serial bus	Detectors max number	Outputs max number	ST.G/IN8-S Max number	ST.G/OUT16 Max number	Notes
MULTISCAN++S2/16	1 closed	16+8(*)	32+6(*)	2	2	

(*) channels enclosed in the panel

Other features:

- Event log can be displayed on the screen or downloaded to a PC.
- RS232 serial port for PC connection for programming and control via specific software.
- Parallel port for printer connection.

1.1) System block diagram



MULTISCAN ++ S2 CONTROL PANEL

(1) RILEVATORI GAS ANALOGICI 4-20 mA / 4-20 mA ANALOG GAS DETECTORS
(2) MODULO 8 INGRESSI ANALOGICI ST.G/IN8-S2 / ANALOG 8 INPUT MODULE ST.G/IN8-S2
(3) CAVO 2 FILI TWISTATI PER Rs485 + 2 FILI PER ALIMENTAZIONE (12-24 Vdc) / 2 TWISTED WIRES FOR THE Rs485 BUS + 2 WIRES FOR THE POWER SUPPLY (12-24 Vdc)
(4) RILEVATORI GAS CON USCITA SERIALE Rs485 / GAS DETECTORS WITH Rs485 OUTPUTS
(5) MODULO 16 USCITE O/C ST.G/OUT16-S2 / 16 O/C OUTPUTS MODULE ST.G/OUT16-S2
(6) MODULO 8 RELE' ST.G/8REL / 8 RELE' ST.G/8REL MODULE

Fig. 1.1) System block diagram

1.2) Technical specifications

Technical specifications	
Housing:	Plastic box IP65 dim. L.470, H.426, D.148 mm.
Inputs:	Max. 16 detectors with RS485 communications connected on the bus directly or by 4-20 mA via STG/IN8 S2 modules + 8 inputs 4-20mA transmission available aboard the panel
Outputs:	6 relays on the unit + 32 Open Collector outputs on STG/OUT16-S2 modules (optional STG/8REL relay board)
Relay Contact rating	8 A at 250 Vac
Optional ST.G/8REL relay contact rating	16A at 250Vac
Serial ports:	2 x RS485) 1 x RS232 (PC connection)
Network connection	Optional TCP/IP module
Power:	100-120 Vac or 200-240 Vac *selectable on the power supply via switch*
Absorption:	Max 10 VA
Warm-up time:	Settable from 2 to 10 min. (default 3 min.)
Display:	Liquid crystal display (LCD)
Optic indications:	Double row of 9 leds
Working temp.	0/-55°C
Storage temp.	-20 ÷ +60 C°
Working RH:	15-85% (non condensed)
Storage RH	5-85% (non condensed)

2) INSTALLATION

2.1) Mounting and electrical connections

After opening the transparent unit door, also open the front panel by rotating the black lock to UNLOCK.
Remove the 4 screws at the 4 corners of the box and remove the front part of the unit box.
Holes can now be drilled in the back of the box for wire passage.
We recommend you use an IP65 wire clamp at wire entrance to maintain the same protection level as the unit.
Secure the back of the unit to the wall using the holes (D) or by the enclosed brakets.

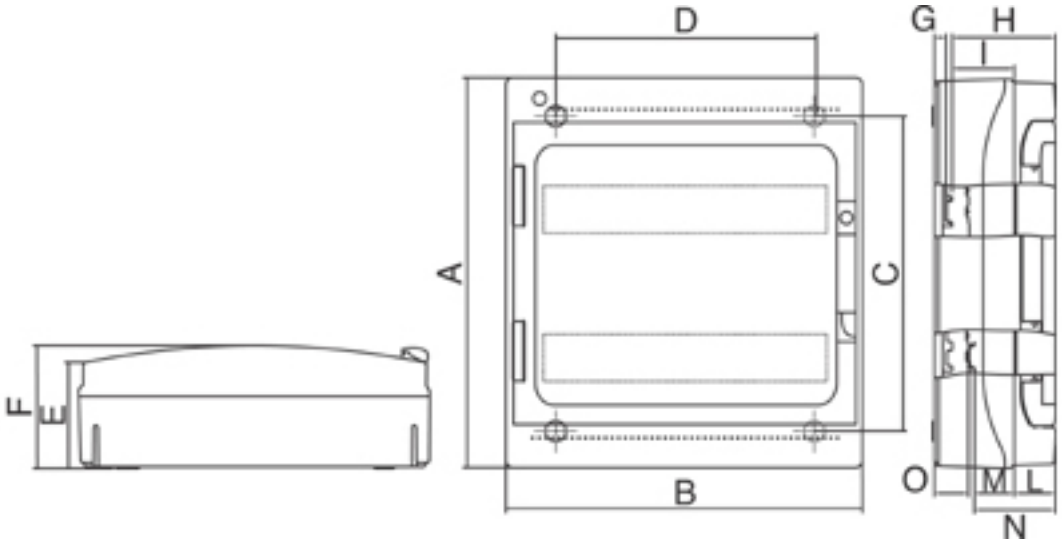


Fig. 2.1 a) Control panel box

Dimensions (mm): A 470, B 426, C 380, D 312, E 128, F 148, G 14, H 125, I 75, L 50, M 48, N 98, O 41

Connect the tri-polar mains wire to the power supply terminal board (minimum 1.5mm^2 per pole) and secure it with the specific wire clamp.

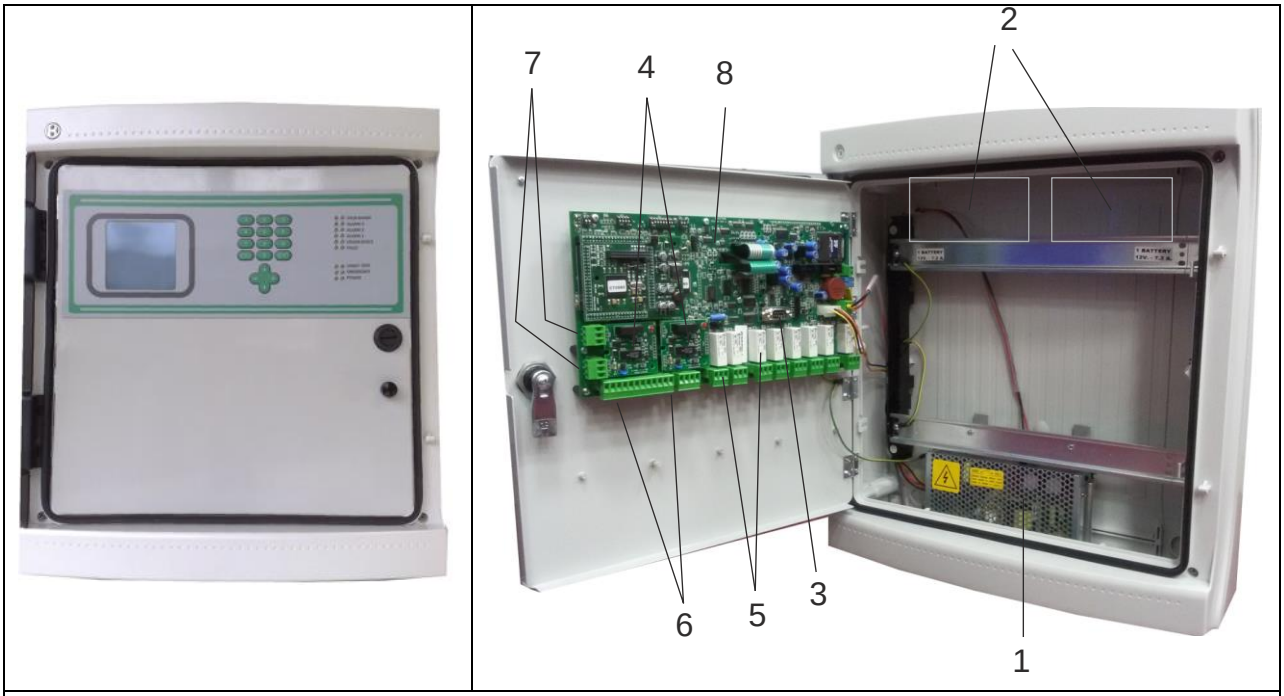
Power the unit and, next, connect the red and black tipped faston wires to the 2 x 12 V 7 Ah max lead buffer battery power supply.

Power Supply

Fig. 2.1 b) Power supply

2.1.1) Diagram and part identification

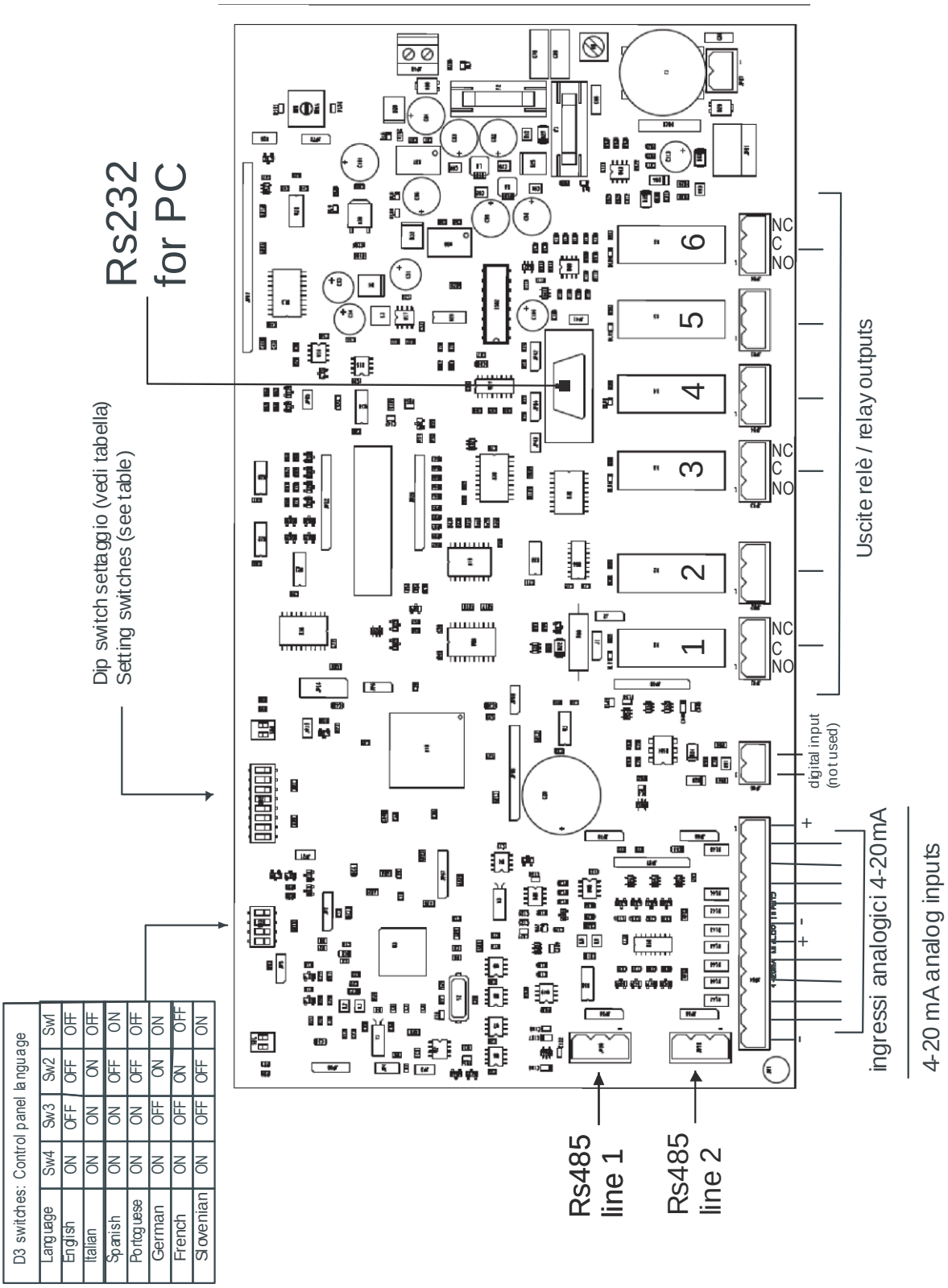
Box version



1- Power Supply (27 Vdc 4A)	5- Relay outputs (8)
2- 2 x 12V 7Ah batteries (not included)	6- 8 detectors 4-20 mA inputs
3- RS232 serial port (PC connection)	7- Bus RS485 bus connections
4- RS485 serial boards	8- Panel main board

Fig. 2.1.1) Unit diagram and part identification

2.1.2) Layout main board



D3 switches: Control panel language				
Language	Sw4	Sw3	Sw2	Sw1
English	ON	OFF	OFF	OFF
Italian	ON	ON	ON	OFF
Spanish	ON	ON	OFF	ON
Portoguese	ON	ON	OFF	OFF
German	ON	OFF	ON	ON
French	ON	OFF	ON	OFF
Slovenian	ON	OFF	OFF	ON

Fig. 2.1.2) Layout main board

2.1.3) Power supply connections

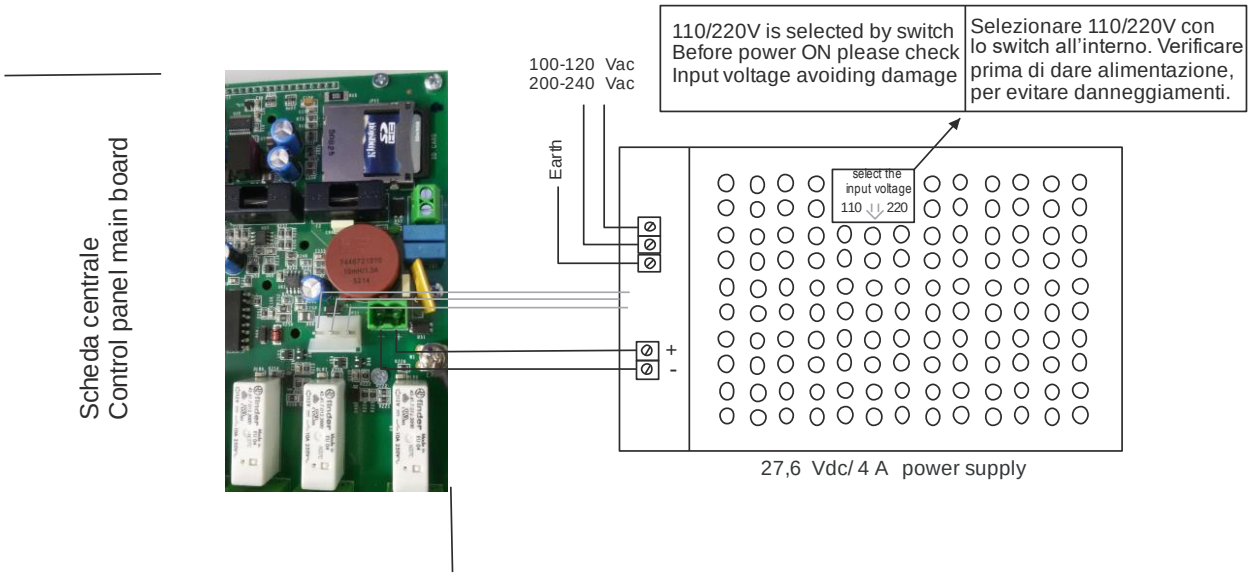


Fig. 2.1.3) Main board power supply connection

2.1.4) DIP switch setting for the RS485 bus, PC communication and control panel language

The series of SD2 dip-switches must be set for:

- Communication (baud rate and protocol) for unit compatibility with various gas detector versions and IN / OUT modules.
- Communication (baud rate) of the RS232 serial port for the communication with the PC

The SD3 dip switch series is for set the language text of the control panel display.

Note: the dip switch state is acquired at the control panel switch ON

D3 switches: Control panel language				
Language	Sw4	Sw3	Sw2	Sw1
English	ON	OFF	OFF	OFF
Italian	ON	ON	ON	OFF
Spanish	ON	ON	OFF	ON
Portuguese	ON	ON	OFF	OFF
German	ON	OFF	ON	ON
French	ON	OFF	ON	OFF
Slovenian	ON	OFF	OFF	ON

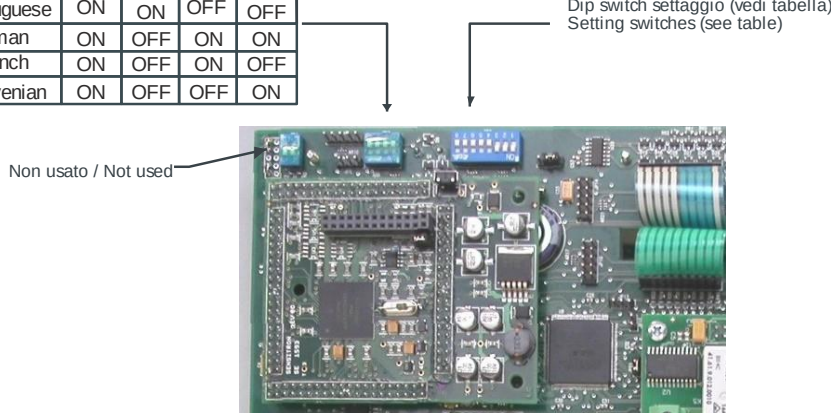


Fig. 2.1.4) Dip-switch SD2 and SD3

Dip-switch 1: Baud Rate Bus RS485

Positione	Velocità comunicazione bus	Detector and Module compatibility
ON	115.200	Smart “S” gas detectors and ST.G/IN8-S2 / ST.G/OUT16-S2 modules
OFF	NU	

Dip-switches 2 and 3: RS485 bus communications protocol

Sw 2	Sw 3	Protocollo	Compatibilità Rilevatori e Moduli	Note
ON	ON	Galileo	Smart “S” gas detectors and ST.G/IN8-S2 / ST.G/OUT16-S2 modules	Baud Rate 115.200
OFF	ON	Not used		
ON	OFF	Not used		
OFF	OFF	Not used		

Dip-switch 4 and 5: Communication (baud rate) of the RS232 serial port for the communication with the PC

Sw 4	Sw 5	Baud Rate
ON	ON	9600 Bit/sec.
OFF	ON	19200 Bit/sec.
ON	OFF	38400 Bit/sec.
OFF	OFF	115200 Bit/sec. (default)

Dip-switches 6 and 7: not used

Dip-switch 8: restore default settings

Position	Function
ON	When turned on, restores unit default settings
OFF	Normal position

2.2) Field device connections

The unit has 2 RS485 data buses connected to field gas detectors. The 2 serial buses can be used in "open" mode or "closed" (1 loop). The choice is set during programming with the PC software.

On the serial lines it is possible to connect the gas detectors (these can be daisy chained on the bus, if detectors are equipped with the RS485 interface, or via remote 8-input modules STG/IN8-S2 with 4-20 mA transmission type) and the output modules STG/OUT16-S2.

The length of each serial line is maximum 1000 mt.

4 conductors are required for device connections: 2 for the RS485 serial bus and two for power supply. For this reason, two different wires must be used or a single wire that has suitable characteristics, described below.

-) The RS485 serial bus must be connected with an EIA RS 485 connection wire: No. 2 conductors with 0.22/0.35 mm^2 section + shield (TWISTED PAIR). Nominal capacity between conductors < 50 pF/m, nominal impedance 120 ohm. Total line length with this type of

connection must not exceed 1.000 meters. An example of a recommended wire is a BELDEN 9841 or similar wire (EIA RS485 data transmission wire). Only connect detectors (and IN and OUT modules) in cascade. Avoid tree or delta connection since they reduce interference immunity.

-) Detector power supply (and IN and OUT modules on the bus) must be connected with a 2-core wire with adequate section based on the number of connected devices, their distance from the power supply and each device's consumption (please see the technical manual enclosed with gas detectors for this purpose).

Each device connected on the unit's RS485 bus must have its own univocal address. STG/IN8-S and STG/OUT16-S2 address settings are described later in this manual. See the manual of the detector for its address settings.

2.2.1) Detectors connection

Gas detectors can be connected to the MULTISCAN++S2/16 control panel in two different ways, based on the detector output signal.

1) 4-20 mA analogue proportional output.

   The detector connected to the unit and ST.G/IN8 S modules will send a 4-20 mA signal referring to its range (i.e. 0-300 ppm, 0-30 ppm, 0-100% LEL etc.) and the unit, suitably programmed, will display the relevant gas concentration indication measured by the detector and consequently activate the alarms when the set values are reached.

2) RS485 digital proportional output

   The detector connected to the unit will send a data signal on the RS485 line. This signal is referring to its range (i.e. 0-300 ppm, 0-300 ppm, etc.) and the unit, suitably programmed, will display the relevant gas concentration indication measured by the detector and consequently activate the alarms when the set values are reached.

Detectors with 4-20mA output

Detectors with 4-20mA analog output are connected to the unit via remote 8-input modules STG/IN8-S2. The modules are connected on the panel's bus to be field mounted far from the control panel.
A 4-20mA transmitter requires a 3-core wire for connections: 2 wires for power supply (usually 12 to 28 Vdc but refer to the gas detector technical manual) and one wire for the 4-20mA signal. A 3x0.75mm^2 shielded wire is recommended since it can cover a 100 m distance between the gas detector and STG/IN8-S input module.

Detectors with 4-20 mA output directly connected to the unit

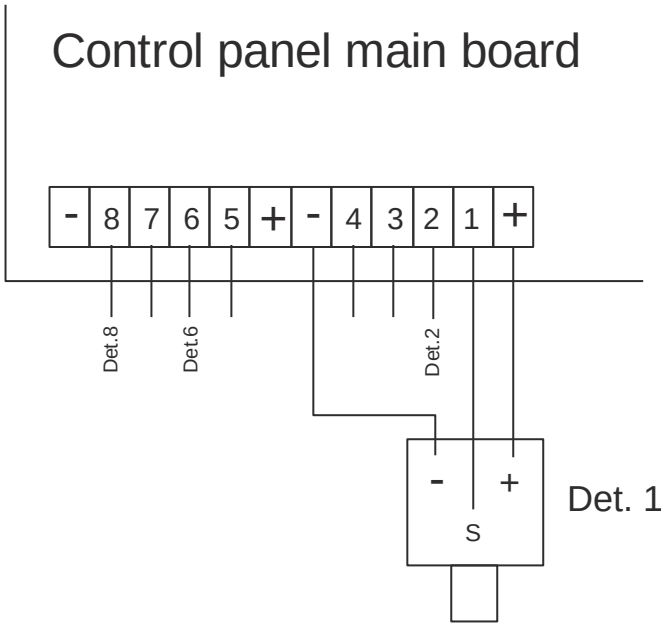


Fig. 2.2.1 a) Connection of the 8 detectors of the control panel

The following diagram explains connections between a 4-20mA gas detector and a STG/IN8-S2 input module. When starting the system, make sure minimum 12Vdc voltage reaches each gas detector.

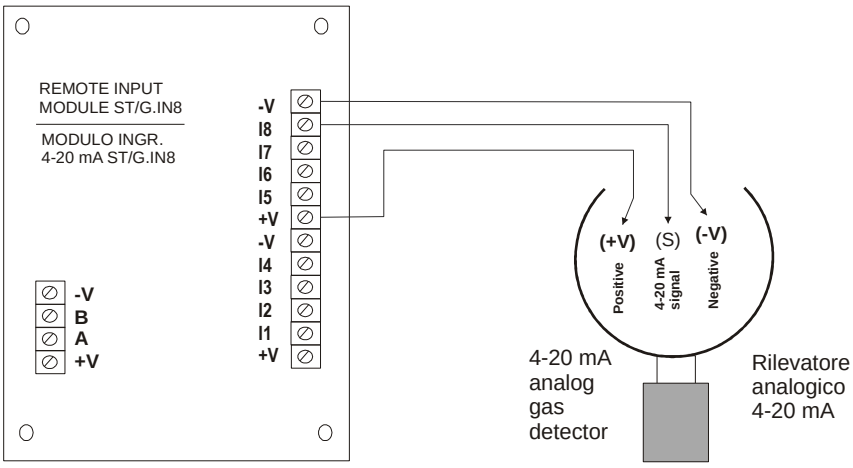


Fig. 2.2.1 b) Connection of the 8 detectors of the ST.G/IN8-S2 module

Detectors with RS485 output

Detectors with RS485 digital outputs are directly connected to the RS485 bus.

4 wires are required in this type of connection: 2 for the RS485 serial bus and 2 for device power supply. For this reason we suggest you use two different wires or a single wire with suitable features as described below.

-) The RS485 serial bus must be connected with an EIA RS 485 connection wire: No. 2 wires with 0.22/0.35 mm^2 section with shield (TWISTED PAIR). Nominal capacity between conductors < 50 pF/m, nominal impedance 120 ohm. Total line length with this type of connection must not exceed 1,000 metres. An example of a recommended cable is a BELDEN 9841 or similar wire (EIA RS485 data transmission wire). Only connect detectors (and IN and OUT modules) in cascade. Avoid tree or star connections since they reduce interference immunity.

-) The power supply to the detectors (and IN and OUT modules on the bus) must be connected with a 2-core wire **with adequate section based on the number of connected devices**, their distance from the power supply and each device's consumption (please see the technical manual enclosed with gas detectors for this purpose).

Note: each detector connected on the RS485 line must have its own univocal address between 1 and 255 (247 for the ModBus protocol). Please see the gas detector technical manual for address settings.

The following diagram explains the bus connection of gas detectors and remote STG/IN8-S2 or STG/OUT16-S2 modules to the control panel.

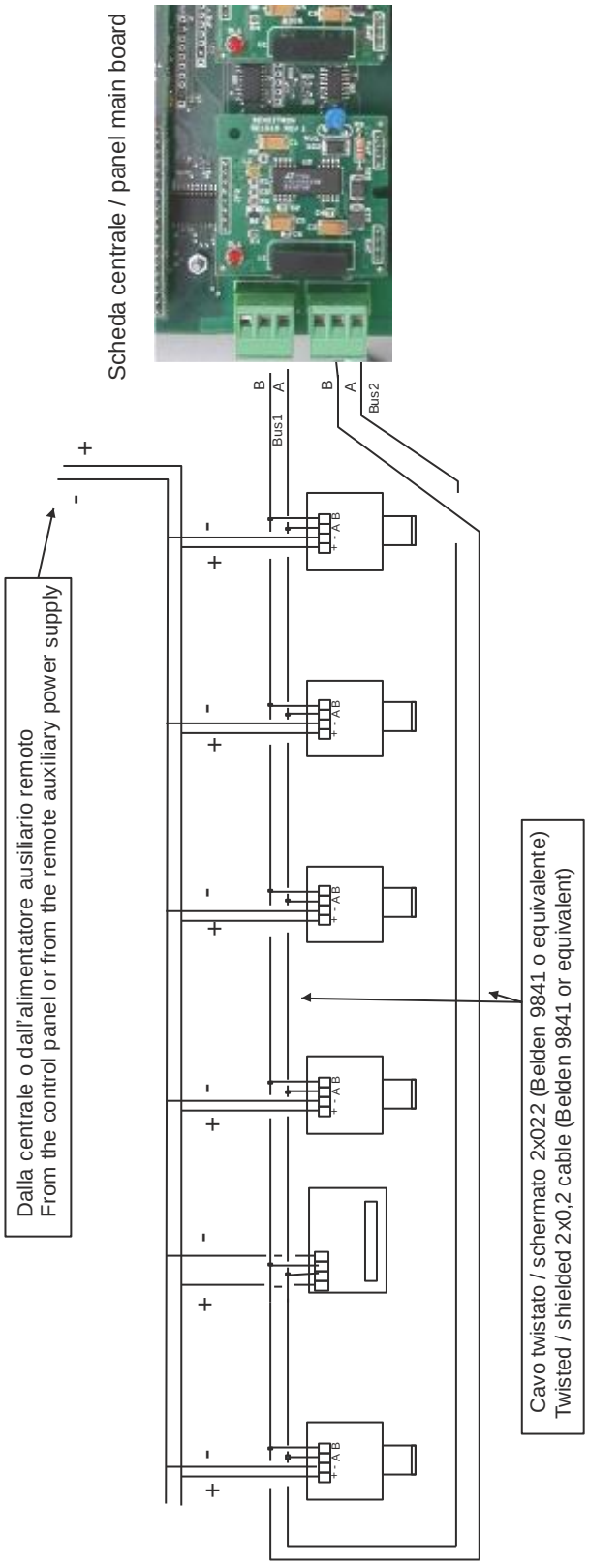


Fig. 2.2.1 d) RS485 bus devices connection (Closed bus)

2.3) STG/IN8-S2 remote input module

STG/IN8-S remote modules are field mounted and are connected to the panel via RS485 buses. They are used to connect 8 x 4-20mA analog gas detectors. Each module must be addressed using the rotary switches on the PCB. The address must be univocal and between 1 and 255. For the maximum number of modules, see the table at chapter. 1- Introduction

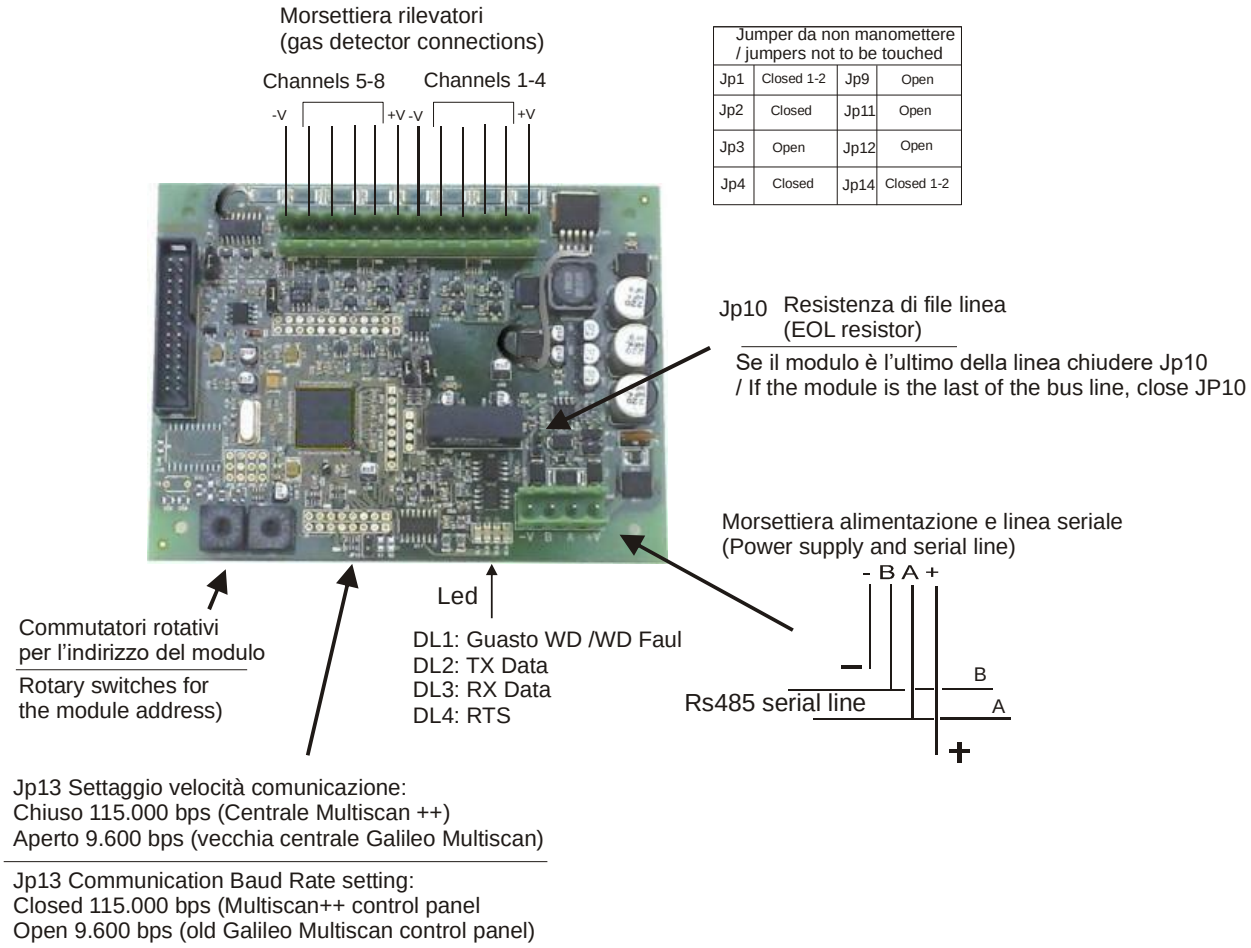


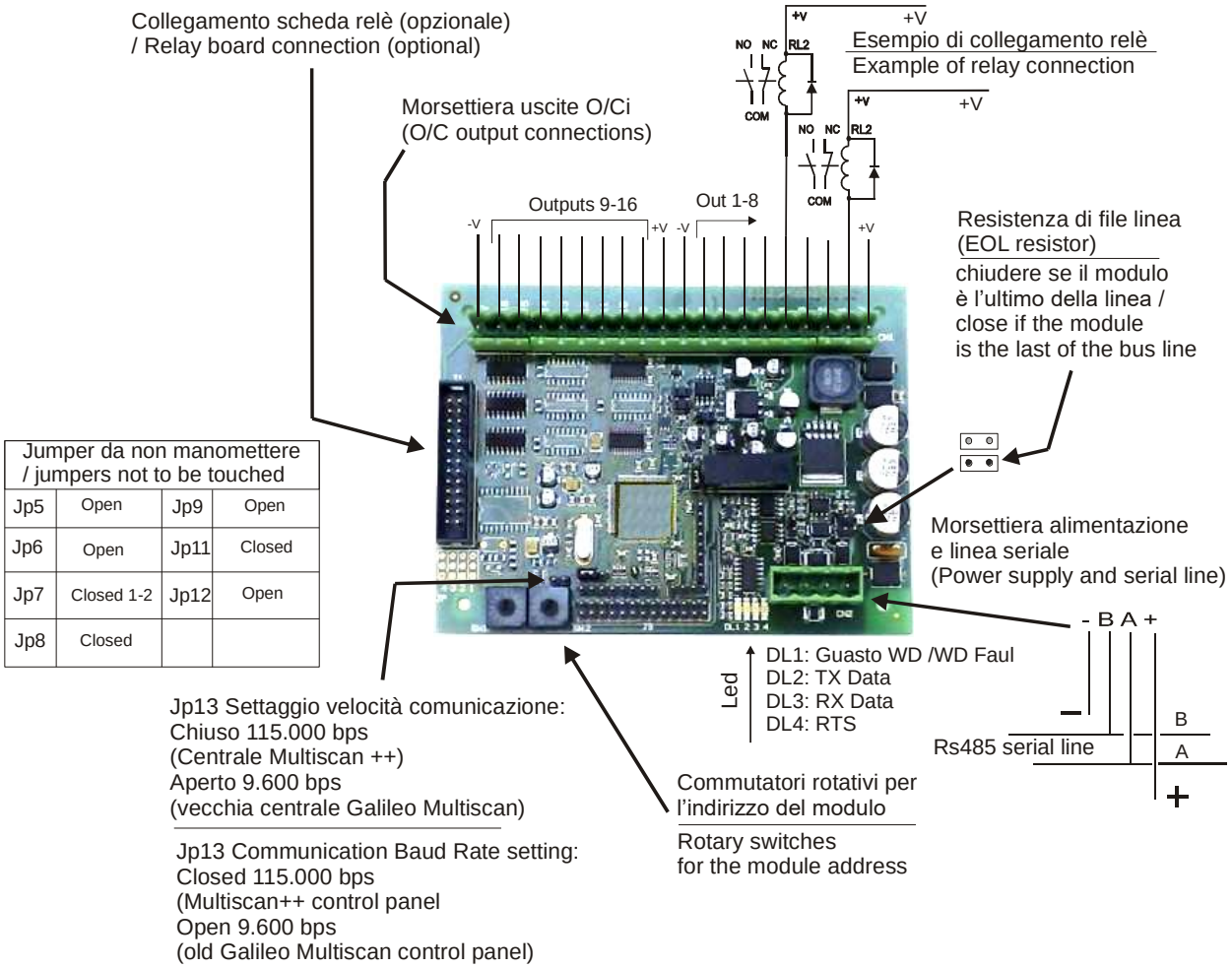
Fig. 2.3) ST.G/IN8-S2 module

2.1) STG/OUT16-S2 remote output module

STG/OUT16-S2 remote modules are field mounted and connected to the panel via RS485 buses. They provide 16 Open Collector outputs (negative switch) with programmable functions to remotely trigger Sirens, Solenoid valves, Relays, etc. Each STG/OUT16-S module can be connected to up to 2 boards of 8 relays that convert the Open Collector output to a powerless exchange contact.

Each module must be addressed using the rotary switches placed on the PCB. The address must be univocal and between 1 and 255 (1-247 for the Modbus protocol).

For the maximum number of modules, see the table at chapter. 1- Introduction

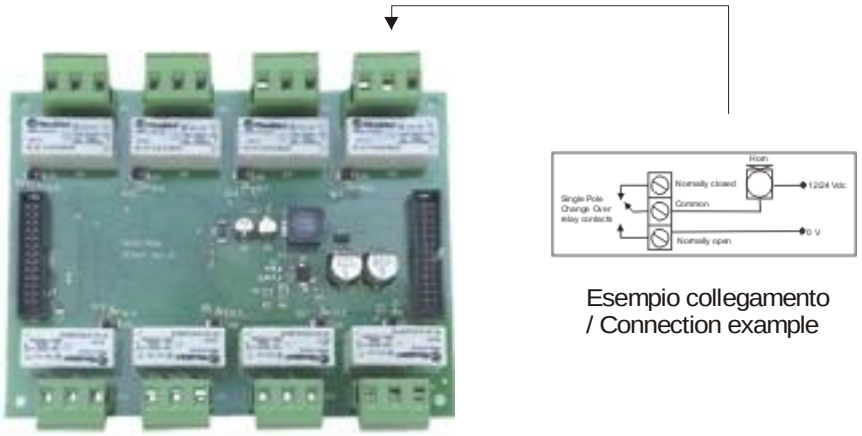


Jumper da non manomettere / jumpers not to be touched			
Jp5	Open	Jp9	Open
Jp6	Open	Jp11	Closed
Jp7	Closed 1-2	Jp12	Open
Jp8	Closed		

Fig. 2.4) STG/OUT16-S2 module

2.1.1) STG/8REL relay expansion board

The STG/8REL 8-relay expansion board converts STG/OUT16-S2 O/C outputs into voltage free changeover contact. Up to two relay boards can be connected to each output module. A relay board is directly connected to the output module (J1 connector) and a second relay board is connected to the first.



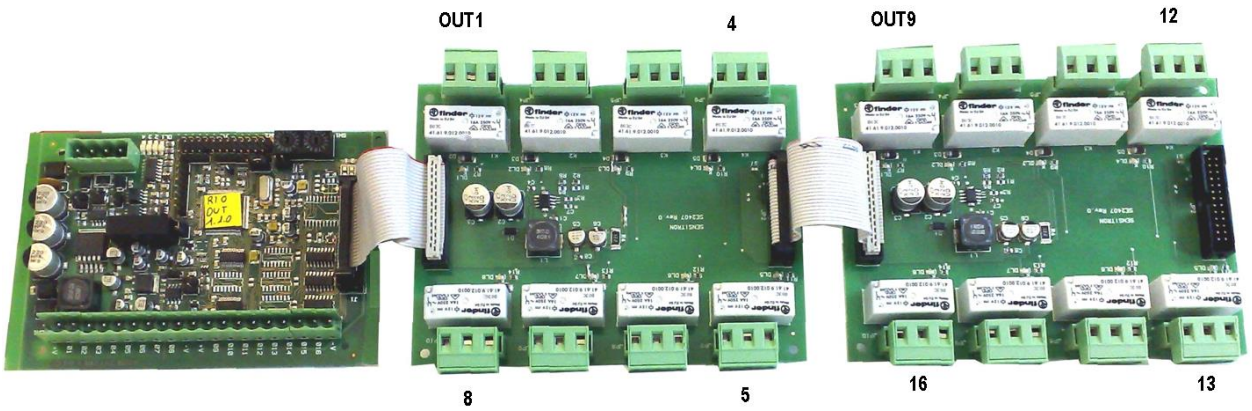


Fig. 2.4.1) Relay board connection to the output module

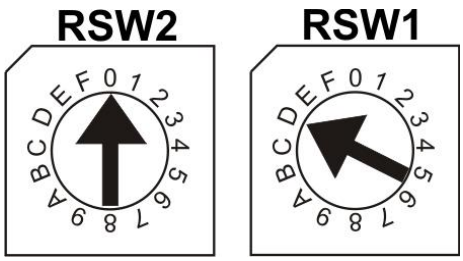
2.1.2) STG/IN8-S2 and STG/OUT16-S2 module addressing

STG/IN8-S2 and STG/OUT16-S2 modules are addressed using the two rotary switches in RSW 1 and 2 hexadecimals. Rotary switches permit hexadecimal settings (base 16). Each switch as 16 positions (0-F) and the pointer is positioned on the number chosen using a screwdriver to create a decimal value between 1 and 255 (see table 1).

For the maximum number of modules, see the table at chapter. 1- Introduction.

Each module must have univocal address in the system. Dual addresses are not permitted even if modules are on different serial buses.

Example:



Se i due commutatori sono posizionati come sopra, RSW2 su 0 ed RSW1 su D, l'indirizzo corrispondente in decimale è 13 (vedi tabella 1)

If the address switches are set in this manner, RSW2 at 0 and RSW1 at D, the corresponding address in decimal number would be 13 (see table 1).

Tabella1: Conversione da decimale ad esadecimale
Table 1: Conversion from decimal to hexadecimal numbers

DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX	DEC	HEX
1	01	38	26	75	4B	112	70	149	95	186	BA	223	DF
2	02	39	27	76	4C	113	71	150	96	187	BB	224	E0
3	03	40	28	77	4D	114	72	151	97	188	BC	225	E1
4	04	41	29	78	4E	115	73	152	98	189	BD	226	E2
5	05	42	2A	79	4F	116	74	153	99	190	BE	227	E3
6	06	43	2B	80	50	117	75	154	9A	191	BF	228	E4
7	07	44	2C	81	51	118	76	155	9B	192	C0	229	E5
8	08	45	2D	82	52	119	77	156	9C	193	C1	230	E6
9	09	46	2E	83	53	120	78	157	9D	194	C2	231	E7
10	0A	47	2F	84	54	121	79	158	9E	195	C3	232	E8
11	0B	48	30	85	55	122	7A	159	9F	196	C4	233	E9
12	0C	49	31	86	56	123	7B	160	A0	197	C5	234	EA
13	0D	50	32	87	57	124	7C	161	A1	198	C6	235	EB
14	0E	51	33	88	58	125	7D	162	A2	199	C7	236	EC
15	0F	52	34	89	59	126	7E	163	A3	200	C8	237	ED
16	10	53	35	90	5A	127	7F	164	A4	201	C9	238	EE
17	11	54	36	91	5B	128	80	165	A5	202	CA	239	EF
18	12	55	37	92	5C	129	81	166	A6	203	CB	240	F0
19	13	56	38	93	5D	130	82	167	A7	204	CC	241	F1
20	14	57	39	94	5E	131	83	168	A8	205	CD	242	F2
21	15	58	3A	95	5F	132	84	169	A9	206	CE	243	F3
22	16	59	3B	96	60	133	85	170	AA	207	CF	244	F4
23	17	60	3C	97	61	134	86	171	AB	208	D0	245	F5
24	18	61	3D	98	62	135	87	172	AC	209	D1	246	F6
25	19	62	3E	99	63	136	88	173	AD	210	D2	247	F7
26	1A	63	3F	100	64	137	89	174	AE	211	D3	248 (*)	F8
27	1B	64	40	101	65	138	8A	175	AF	212	D4	249 (*)	F9
28	1C	65	41	102	66	139	8B	176	B0	213	D5	250 (*)	FA
29	1D	66	42	103	67	140	8C	177	B1	214	D6	251 (*)	FB
30	1E	67	43	104	68	141	8D	178	B2	215	D7	252 (*)	FC
31	1F	68	44	105	69	142	8E	179	B3	216	D8	253 (*)	FD
32	20	69	45	106	6A	143	8F	180	B4	217	D9	254 (*)	FE
33	21	70	46	107	6B	144	90	181	B5	218	DA	255 (**)	FF
34	22	71	47	108	6C	145	91	182	B6	219	DB		
35	23	72	48	109	6D	146	92	183	B7	220	DC		
36	24	73	49	110	6E	147	93	184	B8	221	DD		
37	25	74	4A	111	6F	148	94	185	B9	222	DE		

(*) Indirizzi non disponibili con protocollo Modbus / not available addresses for the Modbus protocol
(**)Indirizzo non disponibile con protocollo Galileo / not available addresse for the Galileo protocol

2.1.3) Detector identification

Every detector connected to the control panel is identified by a code which allows its configuration and contains all the principle data required to physically identify it.

For example:

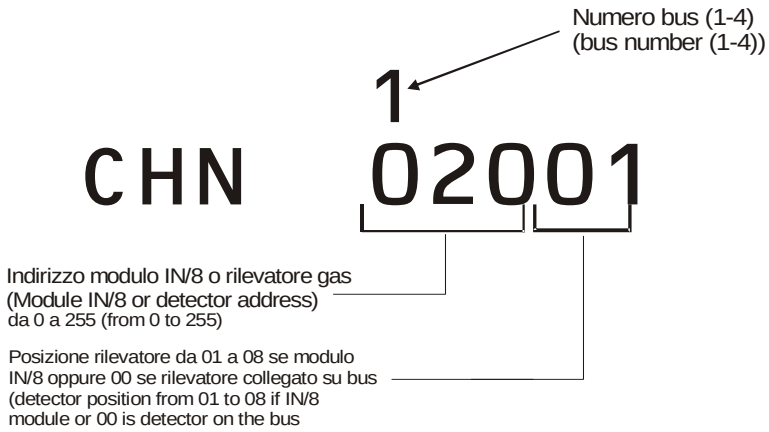


Fig. 2.4.3) Detector number indication

2.2) Programming by PC

The MULTISCAN++S2/16 control panel is fully programmable with a dedicated configuration software. The software has been designed to make the control panel programming simple and fast.

The control panel can be connected to a Personal Computer using the RS232C serial port available on the main board.

The correct serial cable is necessary to connect the control panel to the computer. (The connector pin layout is shown below)

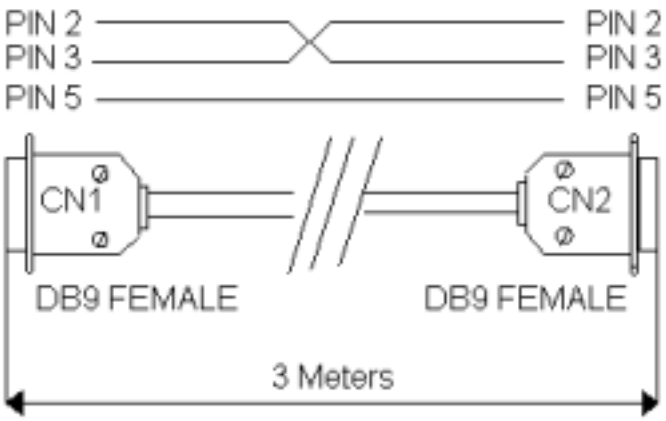


Fig. 2.5 PC Connection cable

2.3) TCP/IP optional module

Via an optional interface, to be connected to the RS232 port, it is possible to connect the panel on a LAN/WAN network with TCP/IP protocol. By this type of connection, the following features are possible:

- Remote modification of the control panel settings, by the configuration software (chapter 4 of the manual)
- Remote management of the control panel, via third parties supervising software, by using the Modbus protocol
- Remote management of the control panel, via a supervising software made by Sensitron (future availability)

For technical features and use of TCP/IP module, please consult the product documentation.

3) SYSTEM POWER UP AND OPERATION

The chapter explains the procedures for the operation, the commissioning and the maintenance of the control unit MULTISCAN++S2/16
For the programming of the MULTISCAN++S2/16 control panel the PC software is required.

Pannello frontale centrale / Unit front panel

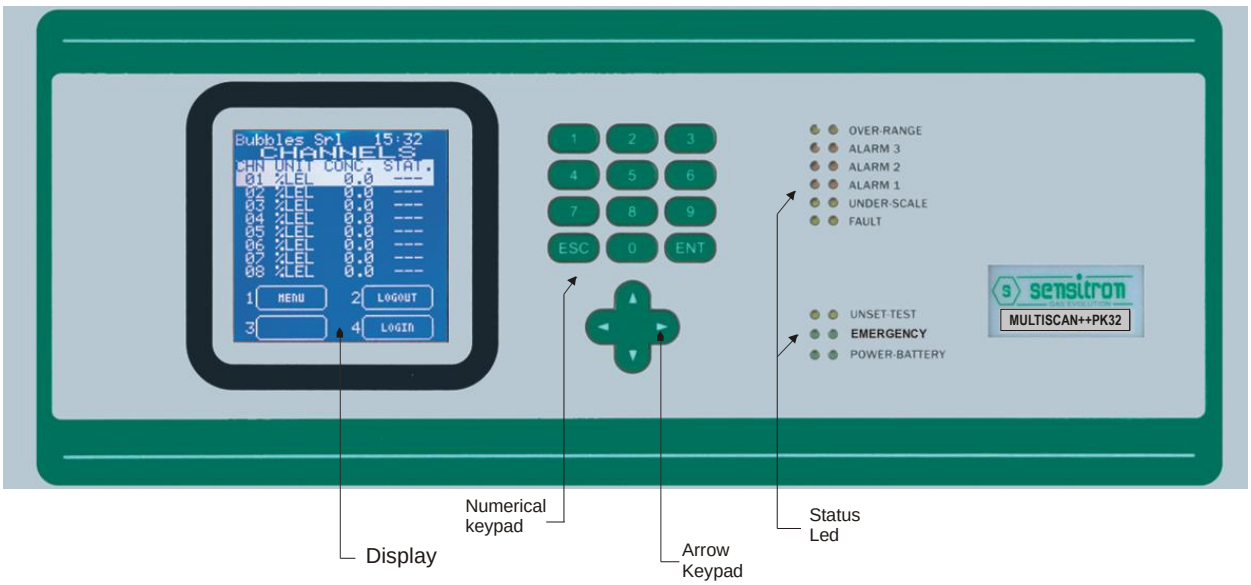


Fig. 3) Control unit front panel

3.1) Power ON

After ensuring correct installation of the MULTISCAN++S2/16, the unit can be switched on.
When first switched on, after the “Warm Up” time (3 minutes by default), the display will show an empty picture without any indication because, at the first switch ON, the control panel needs programming.

Fig. 3.1 a) Warm Up screen

The control panel programming must be performed just by the Personal Computer with the dedicate configuration software (see the previous paragraph for the connection of the control panel to the PC). Refer to the next chapter No. 6 for the configuration software instructions.

For an already configured control panel, the normal screen will show eight channels (detectors) with their status:

Fig. 3.1 b) Typical NORMAL state screen.

3.2) System states and operation

The LCD display provides the user with details about the various system states.

A few general rules apply at any level as follows:

- Should there be a list displayed, the page scrolling can be done using the UP/DOWN arrow keys. Once a selection is made by pressing the ENTER key the display will show a more detailed view of that particular selection.
- All the arrow keys, UP/DOWN, LEFT/RIGHT are being used also to move through the parameter under change fields.
- At any display level, the ESC key will switch back to the previous view. Pressing twice the ESC key, you will go back to the main screen.
- The same, at any display level, should no keys be pressed for more that 3 minutes, the view will automatically switch back to the main window of the Normal mode.

3.2.1) System states

The system is designed to be in one of the following operative states:

NORMAL
ALARM
FAULT
TEST/MAINTENANCE
UNSET
EMERGENCY

NORMAL

It is the normal system operative state without alarms and faults. The screen in this state displays the channels (gas detectors) with measured gas concentration.

Fig. 3.2.1 a) Typical NORMAL state screen.

ALARM

When one or more detectors exceed the preset thresholds, the control unit enters in the Alarm status.
The alarm condition will be activated according to the settings for each and every input

In the alarm window the following info is available:

Fig. 3.2.1.b) Typical ALARM state of the ACTIVE EVENTS screen.

When more than one input channel enters in alarm state simultaneously, alarms are displayed according to the following rules:

1. The events are ordered by severity, as follows: Over-range, Alarm 3, Alarm 2, Alarm 1;
2. Over-range is seen as an Alarm event with the highest severity.
3. In case there are present also other events than alarms, like faults, the alarm events will be in the upper side and the others in the bottom side of the display;

Pressing Enter key, with an alarm event selected, a window is opening showing the details of the related channel as in the next image:

.

Fig. 3.2.1.c) ALARM details screen.

At any access level, by selecting in the main window the 1—Menu and than ACTIVE EVENTS sub menu, it is possible to see the gas detectors in alarm state, or not yet reset.

FAULT

The fault condition will be activated in the following situations:

1. Short circuit or open circuit in a detecting circuit
2. Removal of a remote gas detector or IN and OUT modules
3. Under-scale detection
4. Over-range detection

Fig. 3.2.1.d) Typical FAULT state of the ACTIVE EVENTS screen.

Pressing Enter key, with a fault event selected, a window is opening showing the details of the related channel as in the next image:

Fig. 3.2.1.e) FAULT details screen

TEST/MAINTENANCE

This state is meant for testing and maintenance purpose. This testing function requires an operation sequence and can be activated for each detector being connected.

An user with the OPERATOR or MAINTENANCE level cannot put under TEST/MAINTENANCE more than 50% of the system's channels and outputs.

The signals from channels under TEST will be displayed but will not be considered, in the way that no alarm will be triggered even though the alarm thresholds are being exceeded.

In the same way, the relays under TEST will not be activated, even if an alarm event associated is taking place while the relay is in TEST/MAINTENANCE mode.

EXCEPTION: In case the system just includes one channel only, it will be possible to put that channel under test.
The same principle applies in the case when just one single output is defined. That output can be put under test.

UNSET

The state is useful for virtually excluding single detectors or parts of the system, without physically interrupting the connection.

The UNSET condition may be activated for each channel or part of the system.

In the same way as for TEST/MAINTENANCE mode, a user with OPERATOR or MAINTENANCE level cannot UNSET more than 50% of the system's channels and relays.

The only exception is the ENGINEER level, which may UNSET the whole system if necessary.

EMERGENCY

This is a special defined state into which the system switches when one of the following two situations occurs:

1- Malfunctioning of the control panel power supply
2- AC Fail (230 Vac or 110 Vac missed)

3.3) User levels

The system offers three user levels and, depending on these, various options are available. The three levels are as follows:

1. OPERATOR level (O)
2. MAINTENANCE level (M)
3. ENGINEER level (E)

Once logged in with a certain level, a letter in the top right side of the screen will inform about the level chosen, as follows: “O” for Operator. “M” for Maintenance and “E” for Engineer.

If the user is not logged in, the allowed operations are as per Operator level, without permitting to do the “ACK” of the events.

The user passwords can be created and/modified just by the PC configuration software.

3.3.1) OPERATOR LEVEL

The “Operator” user may only see the system’s configuration. He may browse the system through channels and relays.
The “Operator” cannot put under Test or get out of Test mode any detector or parts of the system, nor he can Unset parts of the system, or Set parts of the system previously unset.
In normal operating mode, the display will show the SYSTEM STATE and will offer the possibility to scroll through the system channels,
The main screen for all user levels is as in the following picture:

Fig. 3.3.1) Typical NORMAL state screen

In the bottom of the screen, the “Operator” level offers the following options:

1	MENU	gets the user into a sub menu (just for the Event Log, the printer options and the System info)
2	LOGOUT	logs out the active user
4	LOGIN	opens the login dialogue window
5	SYSTEM	gets the user into a sub menu (just for a general viewing of the system through the Zone, the Module and Detectors).

See next chapters for details.

In case of Alarm and/or Fault, and/or Emergency, the system will switch automatically to ALARM or FAULT or EMERGENCY mode.
The “Operator” user may only ACKNOWLEDGE (ACK) the event, without being allowed to RESET it.
In effect the only situation when the “Operator” should login is when acknowledging an event. The login is requested for record purposes, thus in the event log a trace is being kept about the user that acknowledged a particular event.

3.3.2) MAINTENANCE level

The “Maintenance” level is the middle user level.
Like the “Operator” user, the “Maintenance” user may see the system’s configuration. He may also browse the system through channels and relays.
Unlike the “Operator” the “Maintenance” user may also put under Test or take out of Test mode any systems part, and he can Unset parts of the system, or Set parts of the system previously unset.

The operations allowed in the Maintenance level main screen are the same as for the Operator level plus the option 3 – SYSTEM available for the TEST, SET and UNSET operation of the channels and the relay.
In case of Alarm and/or Fault, the system will switch automatically to ALARM or FAULT mode.

3.3.3) ENGINEER level

The “Engineer” level is the highest user level.
The operations allowed in the Engineer level main screen are the same as for the Maintenance level.
In case of Alarm and/or Fault, the system will switch automatically to ALARM or FAULT mode.
In effect the only situation when the “ENGINEER” should login is to modify the Alarm levels set-point and when is required to put in Test or in Unset more than 50% of the channels (detectors) or Outputs.

3.4) MENU DETAILS

In the following chapter, the various submenus of the main screen will be detailed.

1	MENU	gets the user into a sub menu (see the next chapter)
2	LOGOUT	logs out the active user
4	LOGIN	opens the login dialogue window
5	SYSTEM	gets the user into a sub menu (the available operations depend on the User level).

3.5) 1- MENU

In the main window in normal mode (without any user login), one may view the system’s configuration details, pressing the key 1 (MENU).

ACTIVE EVENTS (available just if some active event is present)
EVENT LOG
SYSTEM INFO

Other sub-menus may be available, depending on the user login level, see the table below

Operator level (O)	Maintenance level (M)	Engineer level (E)
ACTIVE EVENT (*)	ACTIVE EVENT (*)	ACTIVE EVENT (*)
EVENT LOG	EVENT LOG	EVENT LOG
PRINT	SET PRINTER MODE	SET PRINTER MODE
ABORT PRINT	PRINT	PRINT
SYSTEM INFO	ABORT PRINT	ABORT PRINT
	SYSTEM INFO	SYSTEM INFO

(*) available just if some active event is present

3.5.1) ACTIVE EVENTS

Pressing ENT on ACTIVE EVENT, the list shows the actually active events. If there are active Alarms and active Faults or Emergency situations, these will be shown by splitting the window in two as below. In the upper side the Alarms and in the lower side the Faults and Emergency situations. Using the LEFT/RIGHT arrow, the screen will switch between the two sides of the window.

Fig. 3.5.1 a) Active Events screen with Alarm and Fault

Should there be just Alarms or just Faults/Emergency situations, these will be shown in the upper side of the window, respectively.
Below an example of alarm situation only:

Fig. 3.5.1 b) Active Events screen with alarm only

Or in case just Fault situation is present:

Fig. 3.5.1 c) Active events screen with fault only

In case of a new event, the screen will automatically switch to the Active Events list and the buzzer will sound.
Until the event is acknowledged, the user cannot go back to the main screen. In the upper figures 3.5.1.a, b and c the shown events are not yet acknowledged.
When acknowledged there is a “X” under the column “A”, for the related event.

In this screen there are four available options:

1 ACK
2 RESET
3 CHANNEL
4-PRINT

ACK

By pressing 1 ACK with the cursor on the active event, this will get acknowledged. There are two situations:

1. the user is already logged in.
   In this case by pressing 1 ACK the screen image will simply refresh and an “X” mark will appear on the “A” column (the “Acknowledged” column)
2. the user is not yet logged in.
   In this case the LOGIN dialogue window pops up and the user should key in the password. After which the “X” mark will be shown under the “A” column of the related active event.
   Practically this is the only situation when the login of an “Operator” level user is required so that a trace is being kept about the person who acknowledged the active event.

RESET

Pressing 2 RESET with the cursor on the active event previously acknowledged (the one marked with "X"), this will get reset and the event will disappear from the active events list. As described above, there are two situations:

1. the user is already logged in for a previous operation that requires login.
   In this case pressing 2 RESET the screen image will simply refresh and delete the event line from the list
2. the user is not yet logged in.

In this case the LOGIN dialogue window pops up and the user should key in the password. After which the screen will be refreshed and the event deleted.

NOTE: A user with “Operator” level is NOT allowed to reset active events. He can only acknowledge them so that the display image may be switched back to the main screen. The reset may only be done by “Maintenance” or “Engineer” level users.

CHANNEL

Pressing 4-CHANNEL it is possible to do some operation regarding the channels

PRINT

Pressing 4 PRINT, if a Printer is connected to the system the event details will be printed out.

3.5.2) EVENT LOG

The EVENT LOG is one of the main menu options (available on any user level). Use the UP/DOWN keys to move to the EVENT LOG icon and press ENT.
This opens a screen that displays events in chronological order from the most recent event.

Fig. 3.5.2 a) Event detail screen

- Using the up/down arrow keys one may scroll through the list.
- Using the keys 2 and 4, one may refine the search
- Pressing the ESCAPE key instead will switch back to the main window.

Should 3 minutes pass without any key pressed, the view switches to the Operator main window.

Select Period

This opens a query asking to select the period to be observed by entering the start and the end date.

Fig. 3.5.2 b) Select period dialogue window

The date should be introduced in a 2 digit format for day, month and year: “DD/MM/YY”. As the dialogue window opens, the cursor is already in the “DD” field waiting for the day to be introduced. Keying in the day, the cursor will automatically move to the “MM” field waiting for the month to be keyed in. The same for the year after which the cursor moves to the end date “DD” field and the procedure repeats for the introduction of the

complete end date. In the end, pressing ENTER, the window will next show only the selected period events.
Using the up/down arrow keys one may scroll through the new list.
To exit this view and go back to the main window press ESCAPE key.

Filter
In any of the events screens, by pressing the key 2 **Filter**, it is possible to enter in a sub-menu of the Event Log. Using the up/down arrow keys one may scroll through the list options.

Fig. 3.5.2 c) FILTER options screen

ALARMS
Choosing the Alarms LOG option enters the Alarm events list.
Using the up/down arrow keys one may search in the Alarm event log

FLT & SYSTEM
Choosing the Fault & System LOG option enters the faults and system events list.
Using the up/down arrow keys one may search in the Flt & fault event log

SETTINGS
Choosing the Settings LOG option enters the Settings events list.
Using the up/down arrow keys one may search in the Settings event log

FULL LOG
The FULL LOG option shows all the events, in chronological order, starting with the most recent.
Using the up/down arrow keys one may search in the event log

3.5.3) PRINT

If a Printer is connected to the control panel and in the Set Printer Mode the On Request parameter is selected (see next paragraph 4.5.5), by selecting PRINT and

pressing ENT one starts the printout of the system detector list with all the programming data (Zone, detector description, Alarm levels etc.).

ABORT PRINT

To stop and cancel the printout

SET PRINTER MODE (Users level "M" and "E")

This parameter is used to select the print mode.

ON REQUEST
In this case, the control panel only prints specific details (Event Log, detector list etc.) at the user's request, in the different menu. The printer can be connected and disconnected at any time as required.

REAL TIME
This option switches the printer to on-line mode and requires that a printer be continuously connected to the system. Events are printed as and when they occur.

NOTE: If Real Time is enabled, the event log and other options will not be printed at the user's request. The Real Time parameter must be disabled to permit all other print option to operate.

Fig. 4.5.3) Set Printer Mode option

3.5.4) SYSTEM INFO

At any user level, selecting SYSTEM INFO a window will show the information about the hardware and the software versions:

Fig. 3.5.3) System Info window

3.6) 2-LOGOUT

From the normal mode screen, pressing 2-LOGOUT key, the actual user will logout.

3.7) 4-LOGIN

Pressing 4-LOGIN key a login window will ask for the user password, to allow entering one of the three user levels: OPERATOR, MAINTENANCE or ENGINEER level (see the related chapter 3.3 User levels).

Fig. 3.7 a) Login dialogue window

For the OPERATOR level, login is only required for acknowledging active events, as described in the previous chapter.

After logging in, according to the user level the next window will be in OPERATOR, MAINTENANCE or ENGINEER level. In the right and upper corner of the screen, it will

be displayed what user level is it: “O” for Operator, “M” for Maintenance and “E” for Engineer.

Fig. 3.7 b) NORMAL state screen with the “E” in the right and upper corner

3.8) 3-SYSTEM

In the main window in Normal mode, at any user level, one may view the system’s configuration details, by pressing 3-System. The Zones screen will appear. The Zones screen shows the list of the defined zones. One may move the cursor up and down by using the up/down arrow keys. In the bottom side, the available function buttons depend on the user level.

3.8.1) Zones

In the zones screen, moving up and down with the arrow keys through the zones list and pressing ENTER one gets into the modules screen.

In the modules screen, moving up and down with the arrow keys through the modules list and pressing ENTER one gets into the detectors or outputs screens

In the bottom side, the available function buttons depend on the user level.

In the Maintenance or the Engineer level it is possible to Set or Unset and put in TEST/Maintenance parts of the system.

In the “Operator” level, the SET/Unset and Test/Maintenance options are not active. The user should be in “Maintenance” or “Engineer” level to use the options.

Fig. 4.8 1) Zones screen and options available pressing 3-Zone

SET / UNSET

Pressing 3-Zone in the Maintenance or the Engineer level it is possible to Set or Unset parts of the system.

The number of channels that may be Unset will never exceed 50% of the total channels/relays number or 64 channels/relays, whatever happens first.

NOTE:

The Engineer level is allowed to Unset the WHOLE system, for the complete system maintenance period. Trying to Unset the zone, a message will come out warning the exact number of channels and relays that are about to be unset. If confirmed by pressing Enter key (OK), then the zones window will show the unset status of the zone:

TEST / EXIT TEST

This will put to TEST mode or take out of the TEST mode the selected zone. It is possible to put in TEST mode just parts of the system at user level “Maintenance” or “Engineer”.

If more than half of the system selected, a warning screen as below will pop-up. A screen message came out trying to put in Test/Maintenance mode the only zone defined.

Until the number of zones to put in Test/Maintenance mode does not exceed the defined limits (50%), the selected items will change the status into TEST.

Only the ENGINEER user is authorized to set under Test Mode the whole system. By pressing ENT on the Test command, a new window will appear showing the number of channels (detectors or output) that you are going to set under Test mode. To confirm press ENT (OK). A new window will appear to show the list of system’s zone marked with TST.

NOTE: The Zone TEST function is aimed at helping the Engineer during the Start Up. Indeed, after the system has been switched on and the Control panel programmed, some communication faults may arise from the remote Input modules or detectors connected on the RS485 buses. This situation would generate a large amount of Faults (FLT) that could hardly be managed and would require all Faults to be acknowledged before starting an adequate troubleshooting routine.

The Zone TEST mode allows to overcome this situation the following way: select the Test Mode, the system zones and automatically all detectors belonging to these zone are set in test mode.

In the main window, close to each channel (detector) its status will appear: TST (under TEST) or FLT (fault). Now it will be easy to verify, directly in field, which modules or detectors are not communicating on the RS485 bus and so fix the issues.
When these fault are fixed, the channels status in the main window will change from FLT to TEST.

3.8.2) Modules

In the Zones screen, moving up and down with the arrow keys through the zones list and pressing ENTER one gets into the modules screen

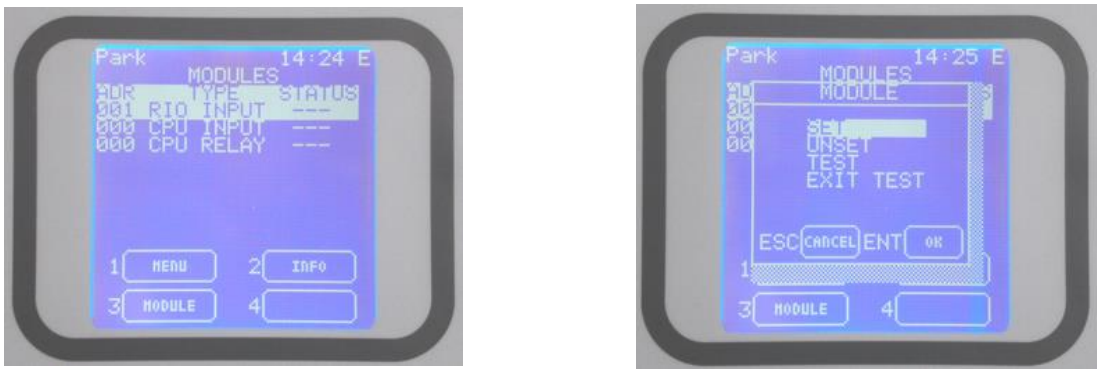


Fig. 3.8.2) Videata Moduli e modalità operative alla pressione del tasto 3-Modulo

3.8.3) Relay outputs

In the modules screen, moving up and down with the arrow keys through the modules list, choosing RIO OUTP and pressing ENTER one gets into the Relays screens.

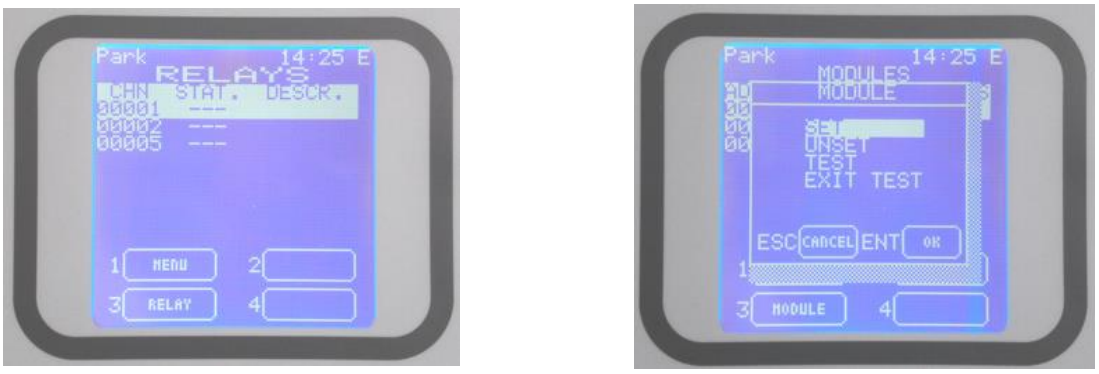


Fig. 3.8 3 a) Outputs screen and options available pressing 3-Relay

Using the up/down arrow keys one may scroll through the list choosing one of the channel and press 3-Relay for the ***SET / UNSET*** and ***TEST / EXIT TEST*** operations.

By the options of the relative screen, unlike the Operator level, the “Maintenance” level and the “Engineer” level may:

- Put in Set or Unset the selected relay

- Put in Test/Maintenance and take out of Test/Maintenance the selected relay

SET / UNSET

Pressing 3-Relay in the Maintenance or the Engineer level it is possible to Set or Unset parts of the system.

An user with the MAINTENANCE level cannot UNSET more than 50% of the system's channels and relays.
The only exception is the ENGINEER level, which may UNSET the whole system if necessary. It is required to do so for maintenance operations in the installation where the gas detection system is installed.

TEST / EXIT TEST

Will put to TEST mode or take out of the TEST (EXIT TEST) mode the selected relay. It is possible to put in TEST mode just parts of the system at user level "Maintenance" or "Engineer". If more than half of the system selected, a warning screen will pop-up.

Until the number of relays to put in Test/Maintenance mode does not exceed the defined limits, the selected items will change the status into TEST.

The relay remains in TEST until the Channel Maintenance Time set for the control panel by the Configuration software (10-60 minutes) is expired.

Fig. 3.8.3 b) Output details screen in "Engineer" level

The relays in TEST status can be activated and deactivated by the options 2-ACTIVATE and 4-DEACTIVATE.

The EXIT TEST option takes out of the Test/Maintenance mode the selected relay.

From the Relay list (Fig. 3.8.3), using the up/down arrow keys one may scroll through the list choosing one of the relay and press ENTER to get into a submenu.

This screen is the same for “Operator” and “Maintenance” level, allowing only to view the relay configuration details.

Fig. 3.8.3 c) Screen with the output operative details

Unlike the above, this screen seen as “Engineer” level, allows changing the relay’s timings. See the chapter 4-PC Configuration for more details.

3.8.4) Detectors (Channels)

In the modules screen, moving up and down with the arrow keys through the modules list and pressing ENTER one gets into the detectors screen

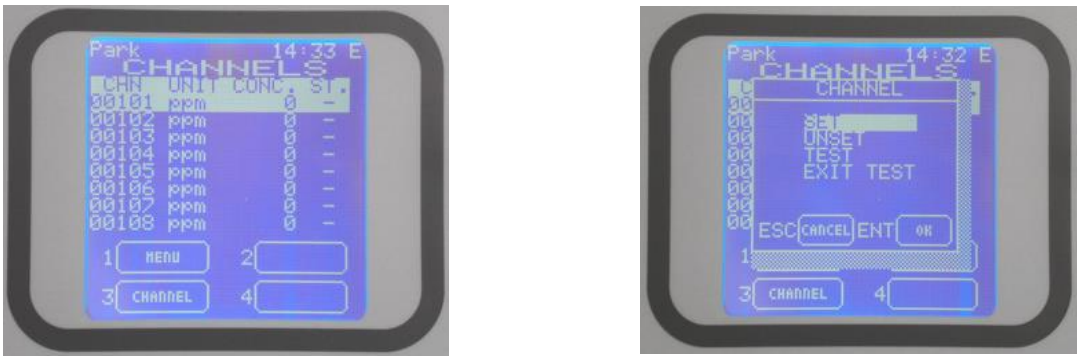


Fig. 3.8 4 a) Detectors screen and options available pressing 3-Channel

Using the up/down arrow keys one may scroll through the list choosing one of the channel and press 3-Channel for the ***SET / UNSET*** and ***TEST / EXIT TEST*** operations.

In the “Operator” level, the options 3-CHANNEL, is not present. The user should be in “Maintenance” or “Engineer” level to see and to use these options.

By the options of this screen, unlike the Operator level, the “Maintenance” level and the “Engineer” level may:

- Put in Set or Unset the selected channel

- Put in Test/Maintenance and take out of Test/Maintenance the selected channel

SET / UNSET

Pressing 3-Channel in the Maintenance or the Engineer level it is possible to Set or Unset parts of the system.

An user with the MAINTENANCE level cannot UNSET more than 50% of the system's channels and relays.
The only exception is the ENGINEER level, which may UNSET the whole system if necessary. It is required to do so for maintenance operations in the installation where the gas detection systems is installed.

TEST / EXIT TEST

This will put to TEST mode or take out of the TEST (EXIT TEST) mode the selected channel. It is possible to put in TEST mode just parts of the system when user level is "Maintenance" or "Engineer". If more than half of the system is selected, a warning screen will pop-up.

As far as the number of channels to put in Test/Maintenance mode does not exceed the defined limits, the selected items will change the status into TEST, as in the screen below:

Fig. 3.8.4 b) Screen with channel in "Test"

The channels remain in TEST mode until the Channel Maintenance Time set by the Configuration software (10-60 minutes) is expired.

The EXIT TEST option takes out of the Test/Maintenance mode the selected channel

In the Channel list (fig. 4.8.4) screen, moving up and down with the arrow keys through the Detectors list, choose 1 and press ENTER to get into the detector's details screen.

This screen is the same for "Operator" and "Maintenance" level, allowing only viewing the Detector configuration details.

Fig. 3.8.3 c) Detector details screen in “Engineer“ level

Unlike the above, this screen seen as “Engineer” level, allows changing the Detector’s details. See chapter 4-PC Configuration for more details.

The above information does not make the manufacturer liable, and the manufacturer reserves the right to make any changes that it retains will be useful to improve the product.

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