inim

Flex5/DAC
Alternating current output expansion

CE

The Flex5/DAC provides 5 terminals for controlling both AC and DC loads.

Each terminal can be configured as an output with the following attribute type:

- Relay, dry contact for AC or DC devices of up to 10A
- TRIAC ON/OFF, electronic contact that functions as a relay for AC devices up to 3.5A maximum
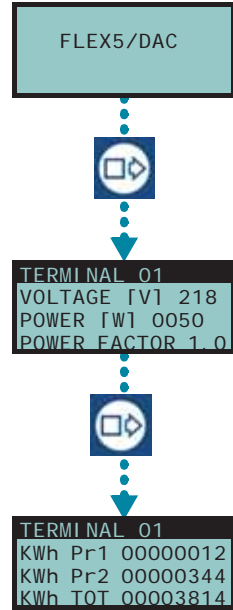- TRIAC dimmer, dimmer contact for power-choke type AC devices of up to 3.5A

Each terminal has a sensor that measures the current (both AC and DC) absorbed by the load and ensures that the terminal is galvanically isolated from the rest of the board.

From the measurements performed on the board and for each of the terminals, the usable electrical parameters are provided both on the Flex5/DAC display (by navigating with the right/left keys) and on the Alien user interface (through the "Commands" section) and via management software for INIM systems:

- Supplied voltage to external load
- Power absorption from external load
  The electrical power value is calculated using the measure of the current drawn and the values of the set or effective voltage, as in the case of the connection with the primary power-supply network.
- Phase displacement or power factor (PF), measured exclusively for AC loads with non-dimmable mains voltage and only when phase and neutral are connected to expansion through terminals **15** and **16**
- Percentage of the supplied power with respect to the maximum possible, measured exclusively for dimmable loads.
- Consumption, in KWh

The consumption can be viewed only on the FLEX5/DAC display and is supplied as a total ("KWh TOT"), as partial ("KWh Pr1" and "KWh Pr2", two partials resettable from the menu) for each terminal and for all devices ("BOARD TOT").
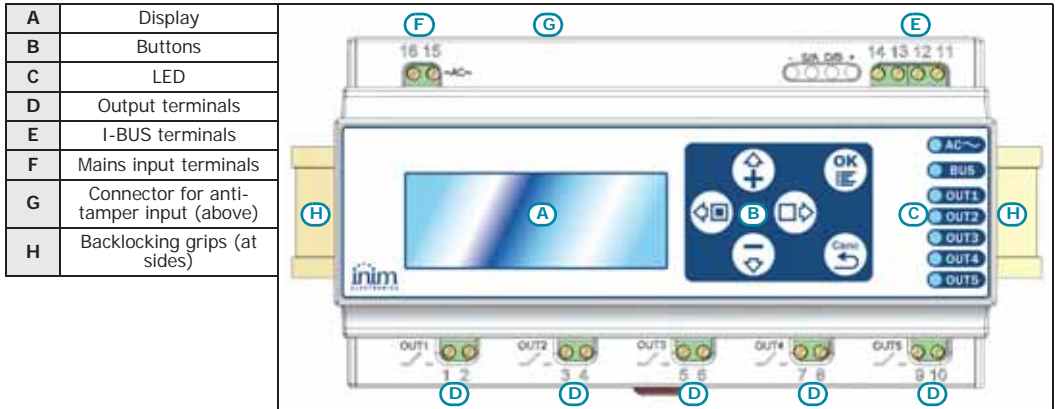
For a detailed description of the functionality and configuration of a FLEX5/DAC in a INIM intrusion control system please refer to the installation manual of the control panel.

FLEX5/DAC

```
TERMINAL 01
VOLTAGE [V] 218
POWER [W] 0050
POWER FACTOR 1.0
```

```
TERMINAL 01
KWh Pr1 00000012
KWh Pr2 00000344
KWh TOT 00003814
```

Technical description 1

Table 1: Flex5/DAC - electrical and mechanical features

Power supply voltage	nominal	13.8V⎓
	range	from 9 to 16V⎓
Voltage connectible to the AC~ input		115/230V~ -15% +10% 50/60Hz
Range of the voltage connectible to the OUTx output	Alternating Current	from 0 to 253V~, 50/60Hz
	Continuous Current (relay use)	from 0 to 253V⎓ @0.35A from 0 to 28V⎓ @10A
Maximum sustainable load from each output	relay output	10A, PF=1
	triac ON/OFF output	3.5A, PF=1
	triac dimmer output	3.5A, PF=1
Operating environmental conditions	temperature	from -10 to +40°C
	relative humidity	≤75% without condensation
Pollution Degree		2
Maximum current draw		200mA
Isolation class		II
DIN-rail mount		9 module enclosure
Dimensions including enclosure (W x H x D)		158 x 88 x 58.5 mm
Weight including enclosure		300g

Table 2: Flex5/DAC - description of parts

A	Display
B	Buttons
C	LED
D	Output terminals
E	I-BUS terminals
F	Mains input terminals
G	Connector for anti-tamper input (above)
H	Backlocking grips (at sides)

The Flex5/DAC expansion board terminals are as follows:

Table 3: Expansion terminal board

n.	icon/identifier	description
1-2, 3-4, 5-6, 7-8, 9-10	OUT1, OUT2, OUT3, OUT4, OUT5	Output terminals
11-12-13-14	+ D S -	I-BUS connection terminals
15-16	AC~	Primary power-supply input terminals

Peripheral activity LED signals are as follows:

Table 4: Flex5/DAC LED

LED	function	colour			status		
		green	**yellow**	**red**	**On**	**Off**	**blinking**
AC~	primary power-supply voltage	present	no voltage	lost	/	/	/
BUS	activity on I-BUS	/	/	/	absent		present
OUTx	output x	relay	triac dimmer	triac ON / OFF	active	inactive	fault

Each terminal is provided with different protection technologies:

- current limiter
- protection varistor
- bypassable "snubber" circuit (for instructions refer to *paragrafo 3 Connecting OUTx outputs*)

If an **OUT** output is to be used as a DC relay, consult the following charts for the correct sizing of the system loads based on the supplied current: **RELAY OUTPUTS**

Maximum DC load breaking capacity

Electrical endurance
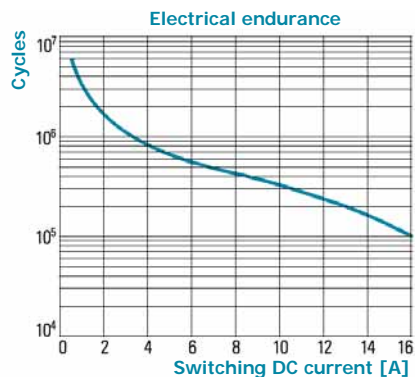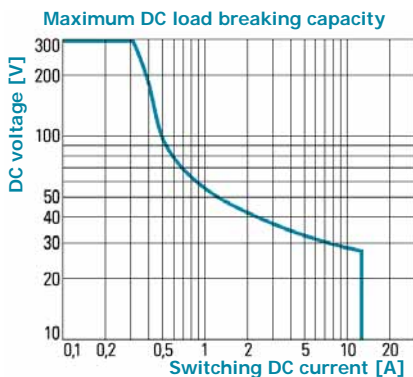
Installation   2

The Flex5/DAC is suitable for DIN Rail mounting.

It must be installed inside a fireproof enclosure with UL 94-5V flamability rating.

TAMPER PROTECTION

It should be protected by a normally open microswitch (not included) which must be applied to the enclosure in which the FLEX5/DAC is installed.

The microswitch should be connected to the appropriate connector (*tabella 2, G*).

Connecting OUTx outputs   3

Each of the 5 **OUTx** terminals on the Flex5/DAC expansion board can be used for connections with both AC and DC powered devices.

Dangerous outputs.

ATTENTION!

The outputs can be used to drive only 5 hazardous voltage devices or 5 safe voltage (SELV) devices.

In normal operating conditions of a SELV circuit the voltage between any two of its conductors or between any of the conductors and the ground must not exceed 42.4V peak or 60V DC. When these values are exceeded, the voltage is to be considered hazardous.

Use of promiscuous mode for devices (hazardous and safe voltage) is possible if one output is relinquished. This output will act as a separator between two diversely driven terminals, as illustrated in the following configuration example:

Table 5: Use of promiscuous mode for terminals

OUT1	OUT2	OUT3	OUT4	OUT5
Hazardous voltage	Do not use	Safe voltage	Safe voltage	Safe voltage
Hazardous voltage	Hazardous voltage	Do not use	Safe voltage	Safe voltage
Hazardous voltage	Hazardous voltage	Hazardous voltage	Do not use	Safe voltage

If the outputs are used on mains (hazardous) voltage, in addition to the above requirements, it is necessary to take the following compulsory measures:

- to connect in series an appropriate protection fuse to the selected output
- to use through phase only or through neutral only for all the terminals

Snubber protection   4

The snubber protection circuit applied to **OUT** terminals can be bypassed without affecting normal functioning of the outputs.

However, it is advisable to bypass the snubber circuit for:

- relay outputs connected to lighting devices
- outputs configured as Triac ON/OFF
- dimmable outputs

Do not bypass the snubber protection circuit in applications which provide for the use of motors.

ATTENTION!

Snubber bypass operations:

When carrying out the following operations ensure that the mains power supply is disconnected from the system.

ATTENTION!

1. Open the cover of the Flex5/DAC by releasing the backlocking grips (*tabella 2, H*).
2. Find the jumper relating to the **OUT** output concerned.
3. Remove the jumper.
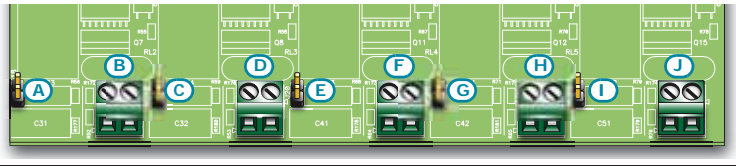4. Close the cover, reset and restart the system.

Table 6: Flex5/DAC - outputs

Output	Jumper	Terminal
OUT1	A	B
OUT2	C	D
OUT3	E	F
OUT4	G	H
OUT5	I	J

Connection to the Mains power source   5

The connection of terminal **AC~** to the primary power source (phase and neutral) is necessary in order to:

• Use an output for control of dimmable devices
• Measure of actual power consumption
• Measure of phase displacement or power factor (PF)

For a correct functioning of these features the loads must be connected to the same mains line connected to the AC~ terminal.

The mains line must be protected by a safety-standards compliant circuit breaker (trip switch).

The circuit breaker (trip switch) must be located externally to the apparatus and should be easily accessible. The distance between contacts must be at least 3mm.

The manufacturer strongly advises the use of a magnetothermic switch with C intervention curve and nominal (maximum) current - 16A.

The protective earthing system must be compliant with all safety standards and laws in force.

**Be careful during the mains connection phase.**
Danger of electric shock.

ATTENTION!

The screw terminals of the AC~ input are galvanically isolated from the rest of the expansion.

Such an input is not used to power the expansion or downstream devices but for the measurement of the electrical network parameters.

Whichever **AC~** input terminal is used for the phase or neutral conductor is irrelevant.
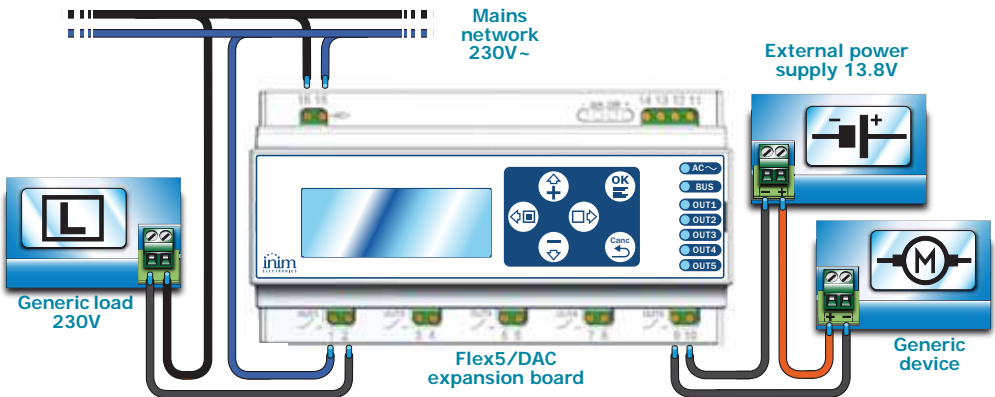
Connection to shutter motors 6

Flex5/DAC can drive shutter motors (asynchronous monophase bidirectional motors) by means of 2 **OUT** terminals.

In addition to this, you have to follow these necessary conditions:

• the 2 outputs must be configured as relay
• the interlock function must be enabled on the pair of terminals
• the 2 outputs must have the snubber circuit protection jumper inserted
• the connection of terminal **AC~** to the primary power source (phase and neutral) is necessary
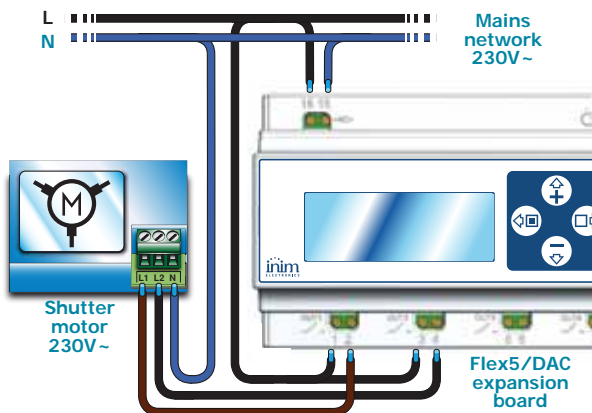
Programming 7

Flex5/DAC expansion board provides a menu for the programming of its parameter settings and viewing of the data corresponding to each of its 5 **OUTx** terminals.

This menu can be accessed by means of the buttons and display located on the front of the DIN enclosure.

Press the **OK** key to view the list of options available on the menu, the **Canc** key will allow you to exit the section you are working on without saving any changes made. The values can be changed using the "+" and "-" keys.

Options available on the menu:

• **Set address**, sezione per impostare l'indirizzo della periferica sul I-BUS.
• **Output options**, list of selectable outputs for parameter changes:
  •• **Restore output**, forces reset in situations of output malfunction. This procedure must be carried out after verifying that the cause of malfunction has been eliminated.
  •• **Set voltage**, for the value setting (in Volts) of the voltage supplied to the output
  •• **Clear KWh Pr1**
  •• **Clear KWh Pr2**, allows reset of the meter for partial consumption in KWh of the individual terminal
• **System options**:
  •• **Clear KWh Pr1**
  •• **Clear KWh Pr2**, allows reset of the meter for overall consumption in KWh of the FLEX5/DAC
• **Set backlight** allows adjustments to the display backlight.
• **Hard reset**, following a request for command confirmation, the FLEX5/DAC will restore the factory default settings.

  This operation will not clear the terminal consumption meters, neither individual nor total.