3.021547 - *I/O Expansion board Kit*

READ AND SAVE THESE INSTRUCTIONS

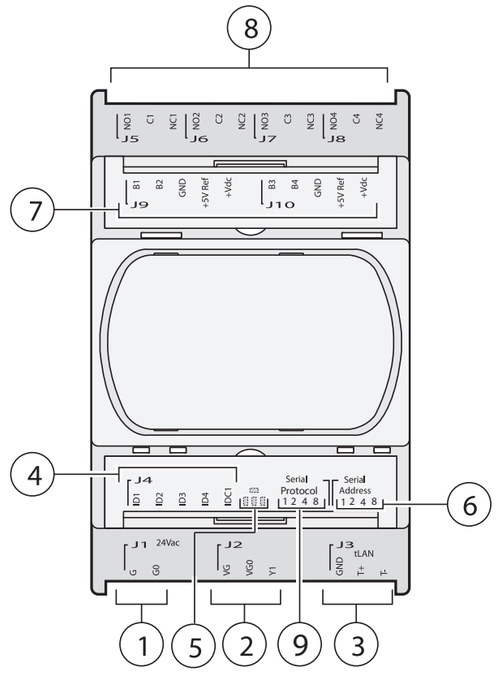

Fig. 1

ENG Key:

1	power supply connector [G (+), G0 (-)];
2	analogue output 0 to 10 V ;
3	network connector for expansions in RS485 (GND, T+, T-) or tLAN (GND, T+);
4	24Vac/Vdc digital inputs;
5	yellow LED showing power supply voltage and 3 signalling LEDs;
6	serial address;
7	analogue inputs and probe supply;
8	relay digital outputs.
9	serial protocol

General characteristics

The expansion board is an electronic device that have been designed to increase the I/Os. A maximum of 5 expansion boards can be connected.

Power supply

When installing one expansion, a safety isolating transformer rated at least 15VA must be used. It is advisable to keep separate the controller from the power supply of the other electric devices (contactors and other electromechanical components) in the electric panel. If the transformer secondary winding is grounded, check that the ground cable is connected to G0 terminal. Make sure that the G and G0 references of all the boards mounted on the panel have the same polarity. (G0 reference must be kept in every board).

Technical specifications

Mechanical specifications

dimensions: can be mounted on 4 DIN modules, 110x70x60 mm;
mounting: on DIN rail.

Plastic enclosure

- it can be fastened on DIN rail according to DIN 43880 and CEI EN 50022 standards;
- material: technopolymer;
- self-extinguishing: V0 (complying with UL94) and 960 °C (complying with IEC 695);
- ball pressure test:125 °C;
- comparative tracking index: ≥ 250 V;
- colour: RAL7035 grey;
- cooling vent-holes.

Electrical specifications

power	28 Vdc +10/-20 % and 24 Vac +10/-15% 50 to 60 Hz - P= 6 W maximum absorption. SELV(Class 2 - UL)
terminal block	with removable-screw male/female connectors - max. voltage: 250 Vac cable cross-section: min. 0.5 mm^2 – max. 2.5 mm^2
CPU	single chip 32 bit; 48 MHz
Operation delay time	0.5 s
Communication frame	baud rate 9600 o 19200 bit/s; stop bits 2; parity none

Analogue inputs

analogue conversion	10 bit A/D converter, built-in CPU
number and type	4 NTC sensors (-50T90 °C; R/T 10 kΩ at 25 °C), voltage: 0/1 Vdc or 0/5 Vdc, current: 0 to 20 mA or 4 to 20 mA, can be selected via software two by two (B1, B2 and B3, B4)
time constant for each input	1 s
0 to 20 mA inputs internal resistance	100 Ω

⚠ WARNING: To power any active probe, it is possible to use the 12 Vdc placed on +Vdc terminal; the max. current that can be delivered is 100mA thermally protected against short circuits. To power 0 to 5 V probes use + 5 Vref (30 mA max.). The 0/1 Vdc signal is limited to the restricted range 0 to 1 V, so it is not always compatible with the standard signal 10 mV/°C of probes (if the temperature is below zero or higher than 100 °C, it can cause probe alarm). So, for the temperature signals use 4 to 20mA or NTC.

Disposal

Information for users on the correct handling of waste electrical and electronic equipment (WEEE).

In reference to European Union di… 2002/96/EC issued o… 27 j… 2003 and the related national legislation, please note that…

1. WEEE cannot be dis… as municipal waste… such waste… collected… posed of separately;
2. the public or priva… collection systems defi… by local leg… must be u… addition, the equipment can be re… to the distributor at the end of its worki… when buyi… equipment;
3. the equipment n… ain hazardous substances: the improper… ncorrect… sal of such may have negative effects on… ealth and on the environment;
4. the symbol (cro… wheeled bin) … oduct or … ackaging … he instruction sheet indicates that the e… has been introduc… the market a… august 200… t it must be disposed of separate…
5. in the event of illeg… al of electrical ar… onic waste, t… lties are spe… local waste disposal legislation.

Expansion dimensions

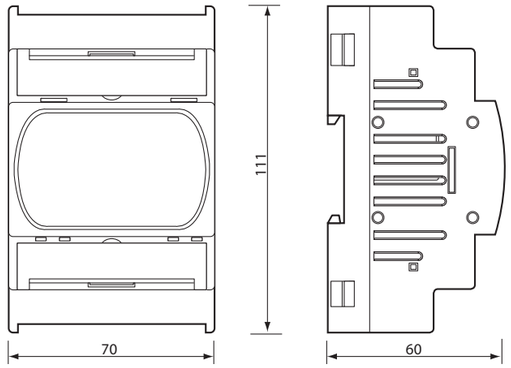

Fig. 2

Serial address

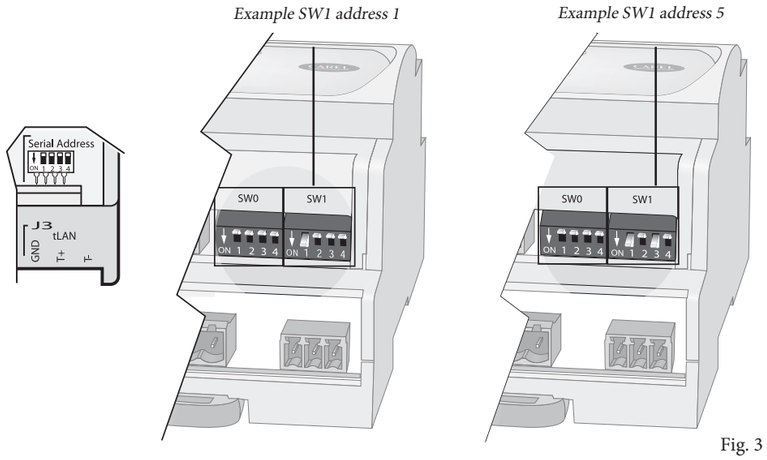

Fig. 3

Serial protocol setting (SW0)

	FUNCTION	OFF	ON
DIP switch 1	**Protocol settings**	**Auto-detection**	**Manual Setting**
DIP switch 2	**Protocol**	**Reserved**	**Modbus**
DIP switch 3	**Baudrate**	**19200**	**9600**
DIP switch 4	**RESERVED FOR FUTURE USE**		

DIP switches 2 and 3 are read only if DIP switch 1 is ON.

Signal LED meaning (see Fig. 1 point 5)

red LED	yellow LED	green LED	meaning
-	-	ON	active supervisor protocol
-	ON	-	probe error
ON	-	-	"I/O mis-match" error caused by the inhibition matrix
Flashing	-	-	lack of communication
-	-	-	waiting for the system startup by the master (max. 30 s)

Digital inputs

number and type: 4 optoisolated D.I. 24 Vac 50 to 60 Hz or 24 Vdc (negative common)

WARNING:

1. in compliance with the standards on the electromagnetic compatibility, use the shielded cable for the RS485 line, in case of the installation of the equipment in domestic ambient;
2. it is necessary to connect a 1.25 aT fuse to the device power supply network;
3. use cables with 30 m max. length, except for power supply, RS485 data transmission and tLAN connection cables;
4. please keep probe and digital input leads as far as possible from power cables to avoid possible electromagnetic noise.
5. Between the digital input and the rest of the board there is a main insulation.

Analogue outputs

number and type	1 output (Y1) optoinsulated 0/10Vdc
power supply	external 24 Vac/Vdc (with 24 Vdc positive on VG)
resolution	8 bit
precision	1%
max. load	1 kΩ (10 mA)

The analogue output (Y1) is isolated from the main board including its power supply (VG-VG0)

Digital outputs

number and type	relay 4; all changeover

There's a main insulation among the relays; the double-insulation does exist towards the rest of the control.

Relay characteristics

approvals	2 FLA, 12 LRA, 240 Vac, Pilot Duty D300, 30.000 cycles(NO). 2A Resistive, 250 Vac, 6000 cycles(NC). --UL60730
	2(2) A, 250 Vac, 100,000 cycles(NO). 2A Resistive, 250 Vac, 6000 cycles(NC). --EN60730-1

Connection to the expansion

type	asynchronous 2-lead half duplex dedicated
connector	3-way plug-in screw connector
driver	CMR 7V balanced differential (type RS485)

The maximum distances between the expansion board and system manager are described in the following table:

with telephone-type cable		with AWG24 shielded cable	
cable resistance (Ω/m)	max. distance (m)	cable resistance (Ω/m)	max distance (m)
≤ 0.14	600	≤ 0.078	600
≤ 0.25	400		

Other specifications

storage conditions	-40T70 °C, 90% r.H. non-condensing
operating conditions	-40T70 °C, 90% r.H. non-condensing
index of protection	IP20, IP40 (front panel only)
pollution degree	3
overvoltage category	III
classification according to protection against electric shock	to be integrated into Class I and/or II devices
PTI of insulating materials	250 V
period of electric stress across insulating parts	long
type of actions	1C
type of disconnection or microinterruption	microinterruption
category of resistance to heat and fire	D (UL94 - V0) category
immunity against voltage surges	category 1
ageing period (operating hours)	80,000
no. of automatic operating cycles	100,000 (EN 60730-1) 30,000 (UL)
software Class and structure	Class A

The device is not intended to be hand-held.

Warning: for applications subject to strong vibrations (1.5 mm pk-pk 10 to 55 Hz), we suggest you to fasten, through fastening clamps, the cables connected to the expansion at about 3 cm of distance from the connectors.

Serial protocol settings (SWO)

	Supply conditions	Configuration for Immergas controllers
DIP switch 1	OFF	OFF
DIP switch 2	OFF	OFF
DIP switch 3	OFF	OFF
DIP switch 4	OFF	OFF