GEFRAN

G3-AU4

G-Mation G3 – 4 high resolution analog inputs module

USE AND INSTALLATION MANUAL

G3 AU4 code F092705
code: 80657 - Ver 1.0 - 11-2025 - ENG

CONTENTS AND INDICES

1. PREFACE

1.1. Warnings and safety

Although all the information in this document has been carefully checked, Gefran S.p.A. cannot be held liable for the possible presence of errors, or for damage to persons or property due to improper use of this manual.
Gefran S.p.A. also reserves the right to make changes to the content and form of this document and to the features of the devices it describes at any time without prior notice.

The devices described in this manual must be installed by qualified technicians, following current laws and regulations and in accordance with the instructions given in this manual.
If the card is used in applications with risk of injury, or of damage to machinery or materials, it must be combined with auxiliary alarm devices. It is advisable to provide for the possibility of checking alarm activation also during normal operation.

Before interacting with the card, the operator must be adequately instructed in the system operation, emergency, diagnostics and maintenance procedures.

1.2. Typographical conventions used in the manual

Pay attention when the following symbols are found in the manual.

Indicates particularly important information relevant to correct product operation or safety, or provides instructions that must be strictly followed

Highlights a risk condition for the installation technician or user due to hazardous voltage levels

Identifies an action that is possible / permitted

Identifies an action that is NOT possible / NOT permitted

1.3. EtherCAT declaration

EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

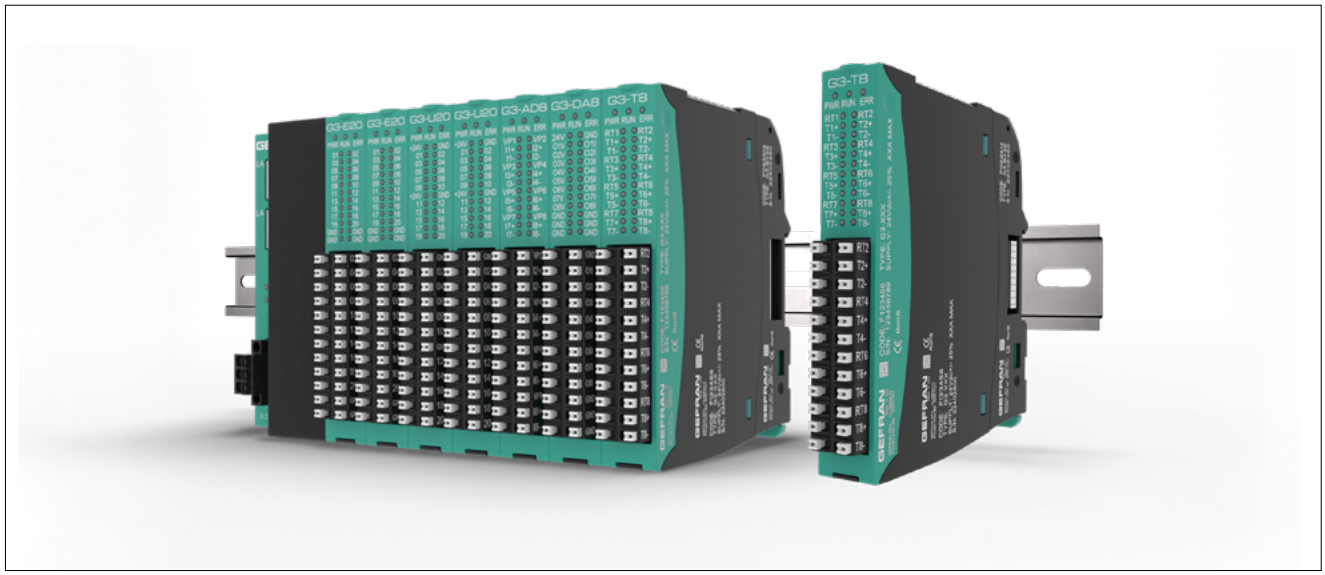
2. G-MATION G3 PLATFORM

2.1. System

G-Mation G3 is a modular IO system based on EtherCAT technology. EtherCAT provides a maximum of 65535 addressable modules.
A G3 rack of I/Os is composed of the system coupler, G3-ECAT, with a number of I/O boards on the right side as desired according to system needs and up to a maximum of 20.
The G3-ECAT module provides power supply for 20 boards.

If a number of boards greater than 20 is necessary, the power supply module G3-PWR must be inserted between the 20nd and 21st boards.

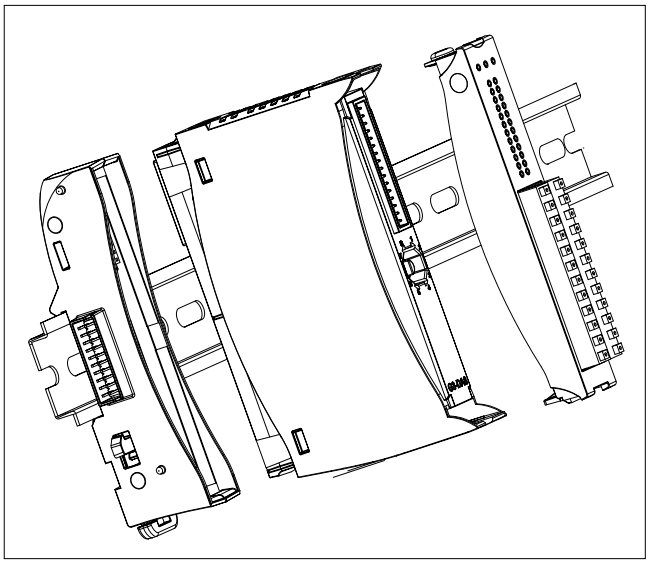
The boards are designed for coupling on a 35 mm DIN rail and the lateral coupling with the rack takes place by sliding to the left (refer to paragraph “2.6. DIN rail mounting” on page 13).

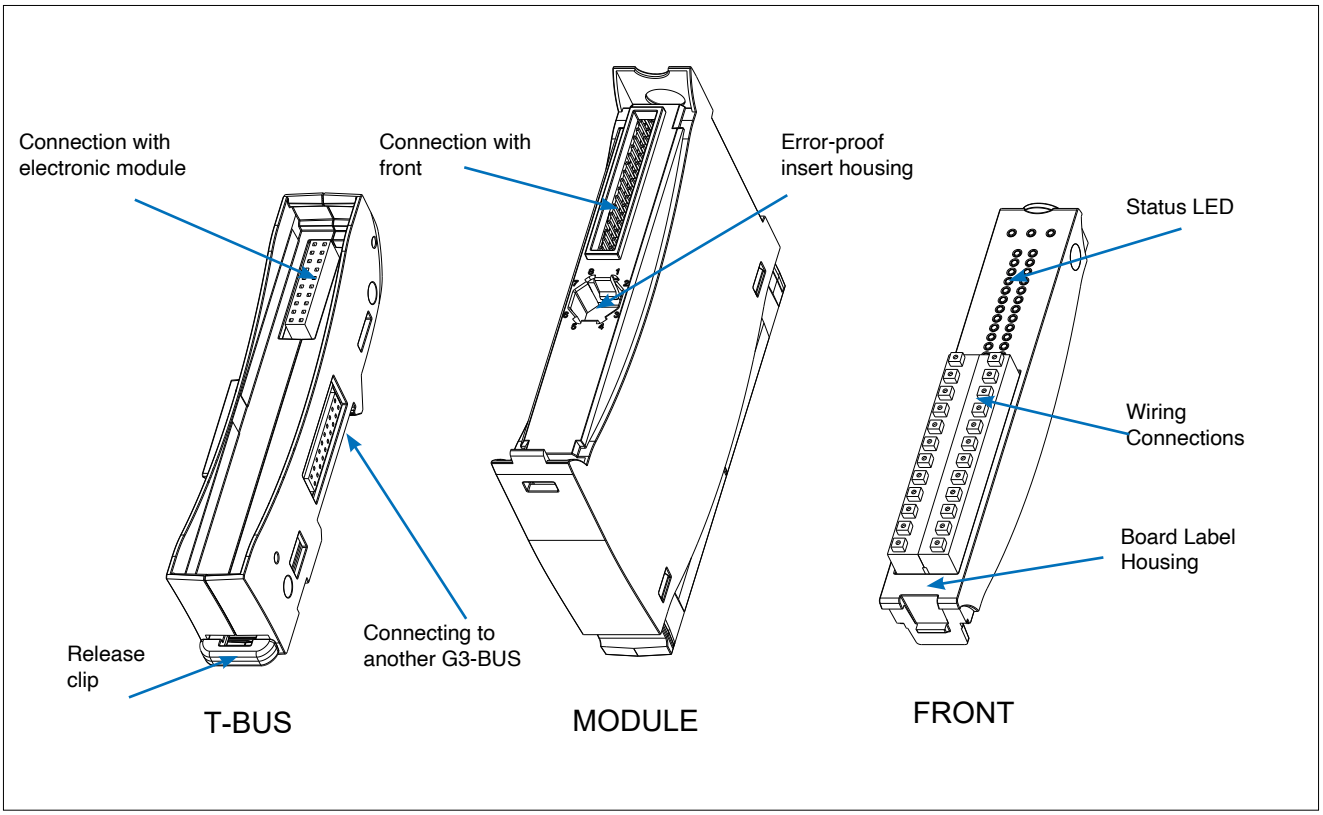


2.2. Board modularity

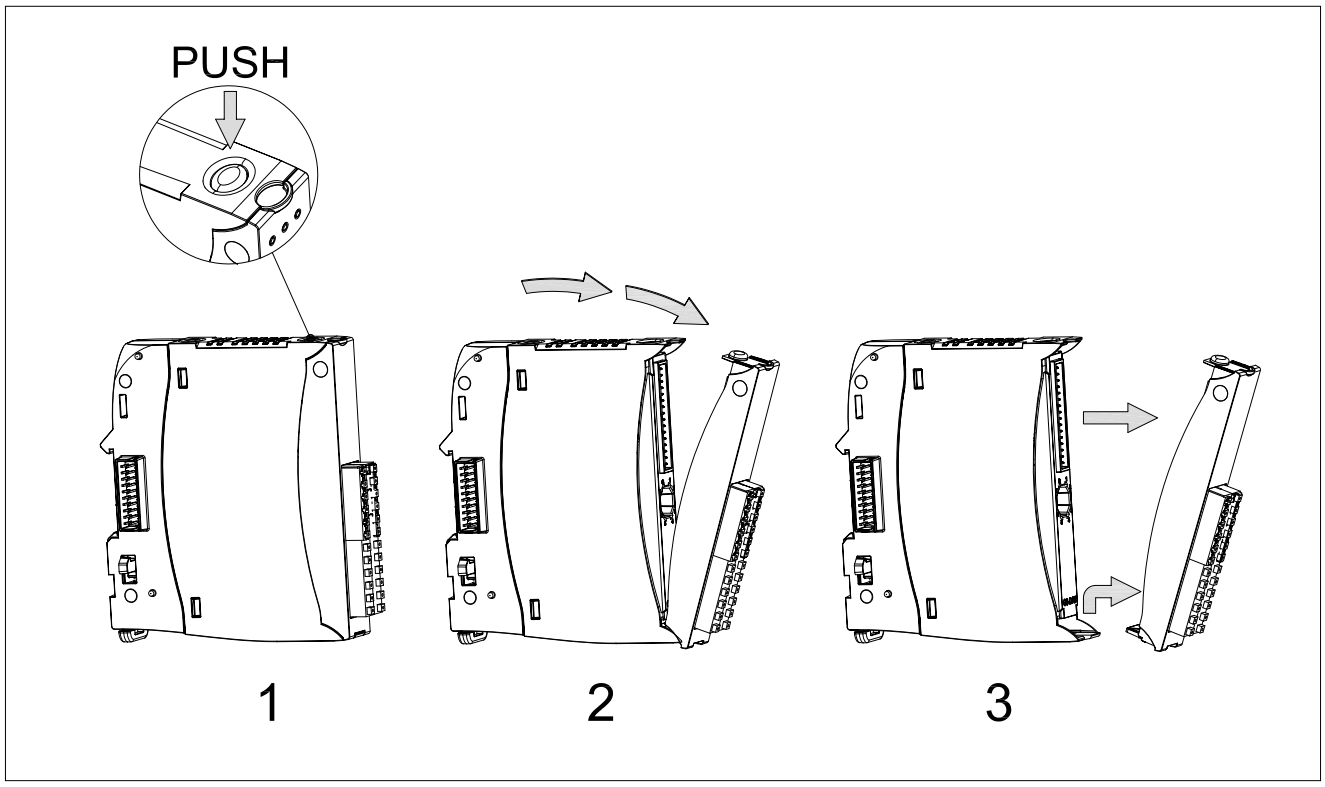
Each I/O board consists of three parts:

- **The base module:** it is the module that guarantees coupling with the din rail and bus transmission between one board and the next. It is called G3-BUS (F092614) and is common to all boards.
- **Electronics:** is the module that contains all the electronics dedicated to managing board I/Os. It is proprietary to each board.
- **The front:** it is the module that houses the push-in connector for the wiring and the front LEDs. It is proprietary to each board

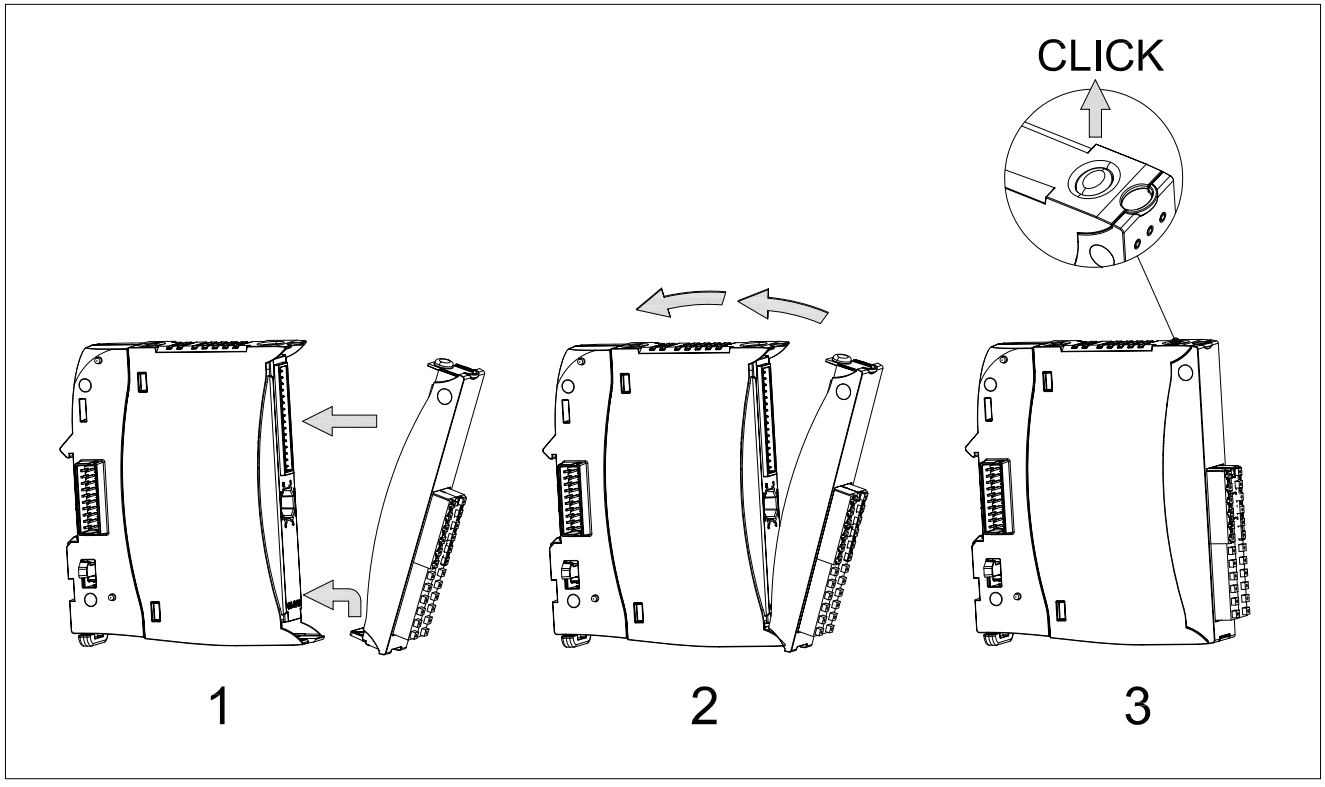




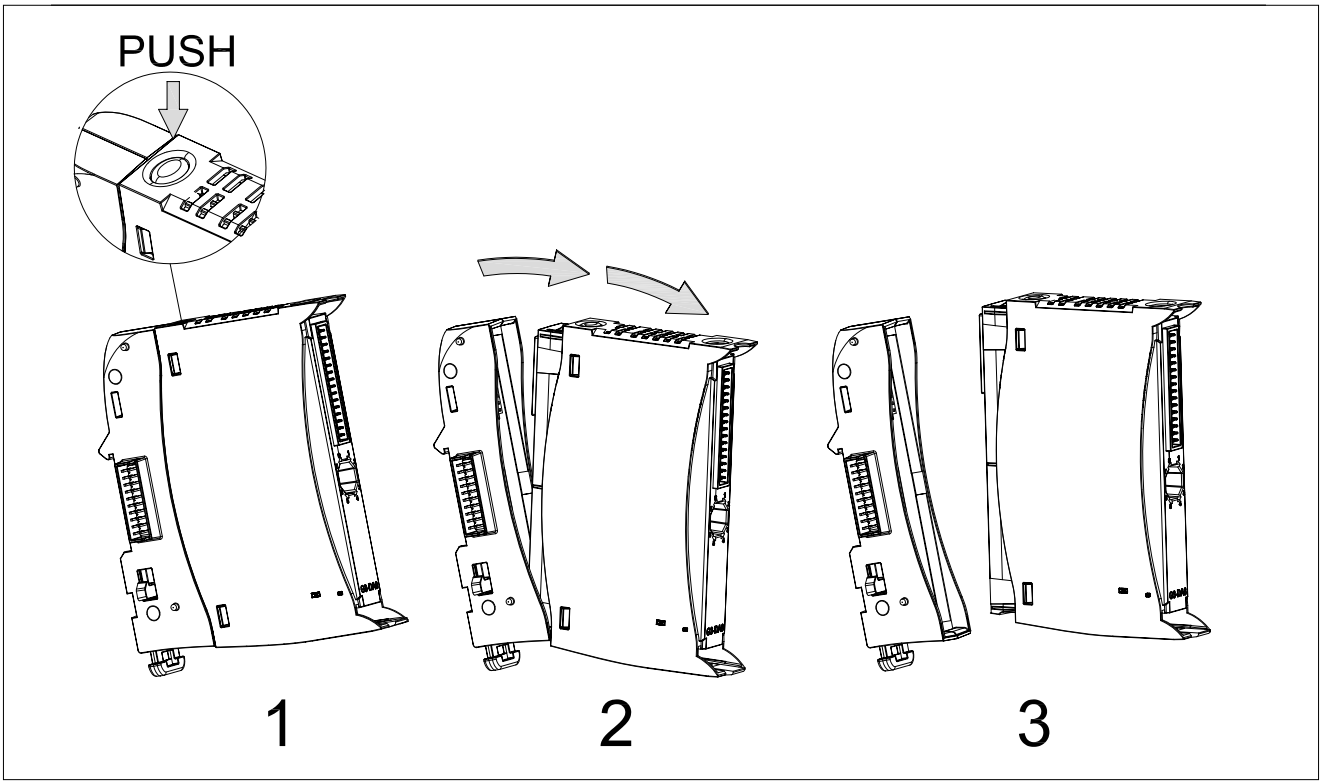
The coupling and uncoupling between the different parts is possible without the use of tools, using only your hands. The movement is constrained in such a way as to be easy and to prevent alignment errors that could compromise the connections.
Press the upper button as shown in the figure and pull the board down in the indicated direction to remove the front module.



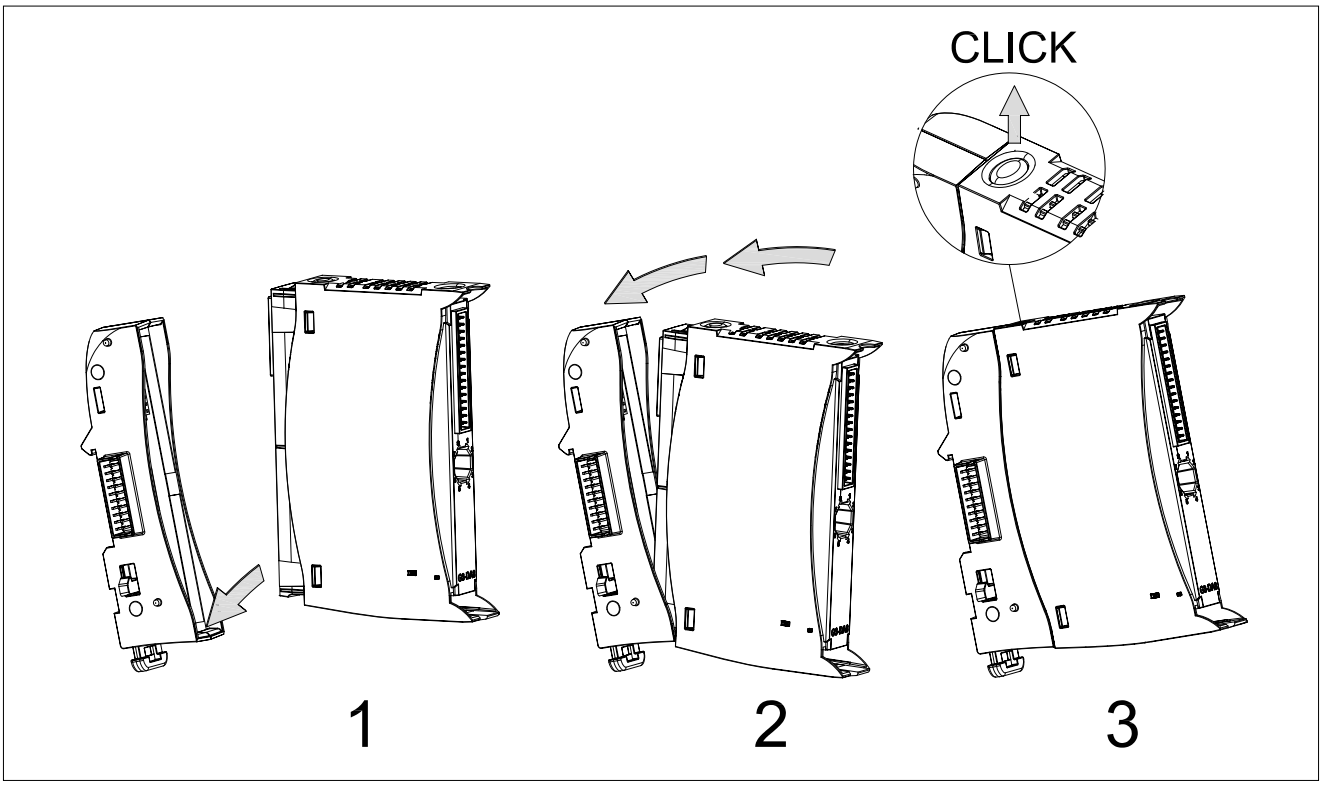
To re-couple the module, first place the lower part inside the constrained housing of the electronic part and then push the front until you feel the upper button couple.



The electronic part can be detached from the base both with the front connected and without. To release the electronic part press the upper button as shown in the figure and pull the board down in the indicated direction.

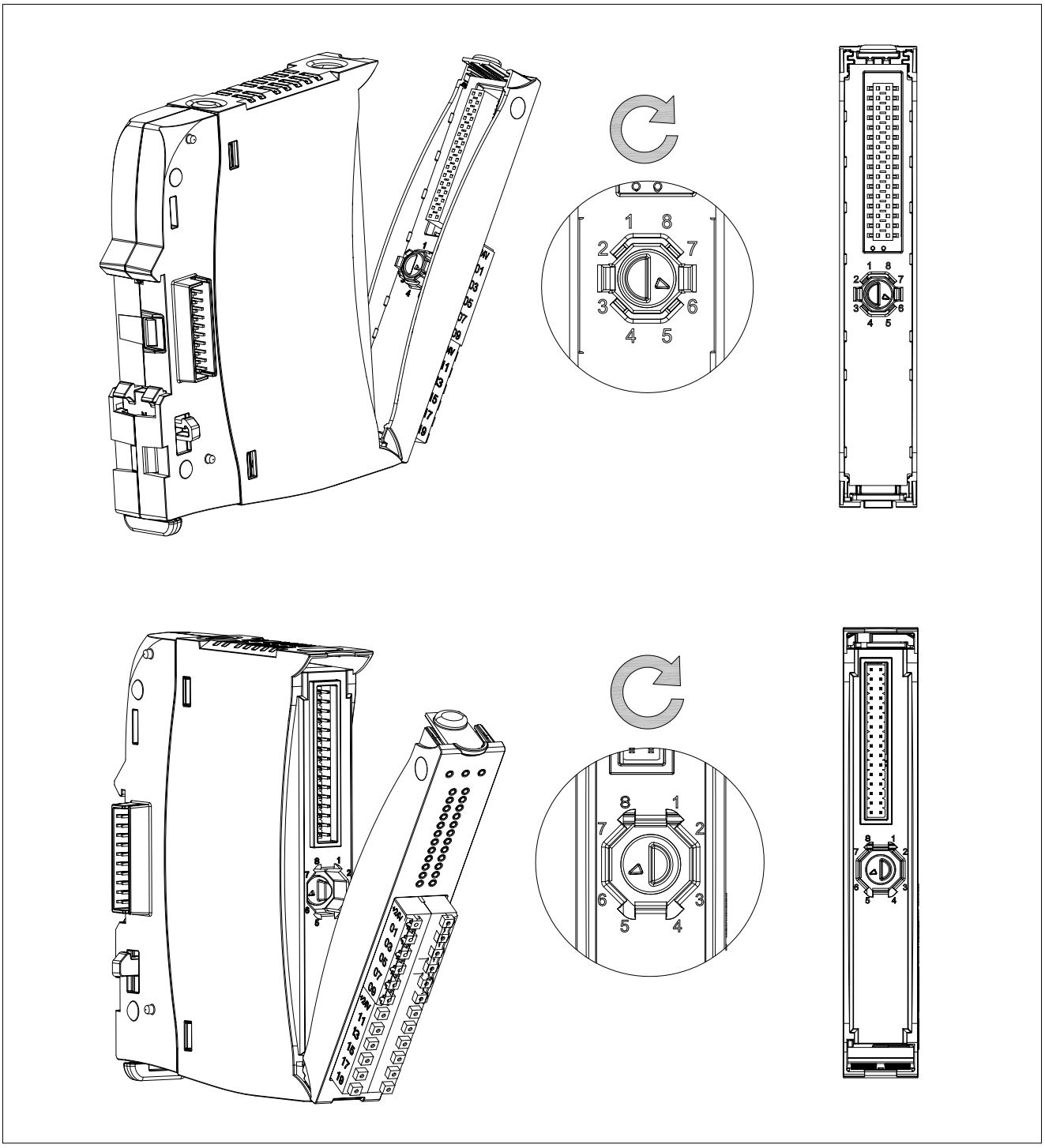


To re-couple the electronics, first place the bottom part inside the constrained housing of the base and then push the board until you feel the upper button couple.

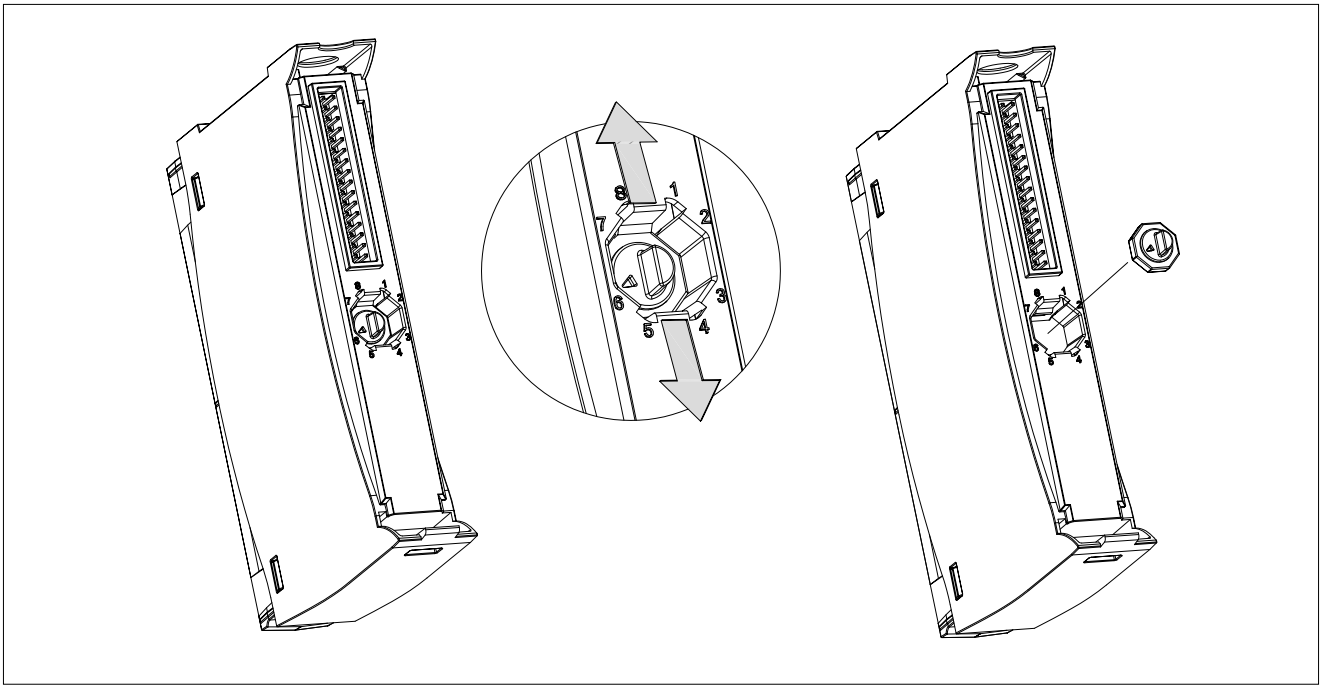


2.3. Front polarisation

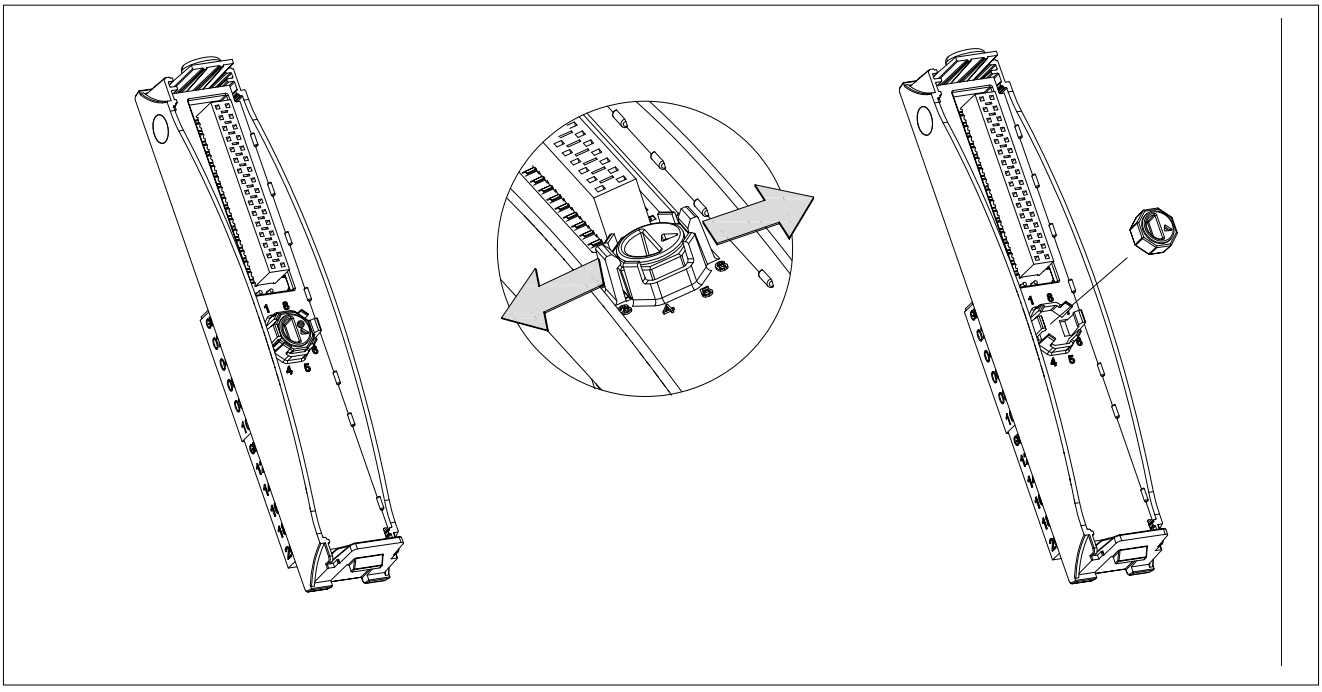
A polarisation system is provided that allows you to associate a front to your board to avoid board and front positioning errors.
A kit of male-female coupled octagonal-shaped inserts may be provided as an accessory.
The figures on the insert are available in different versions so as to cover a wide range of combinations.
There is a housing for the male insert and one in the front for the female insert in the electronic part.



The insert must be mounted with the aid of tweezers and can be rotated in eight different positions.
Proceed as shown in the figure by grasping the insert with tweezers to insert or remove the insert from the electronic board.



Proceed as shown in the figure by grasping the insert with tweezers to insert or remove the insert from the front module.

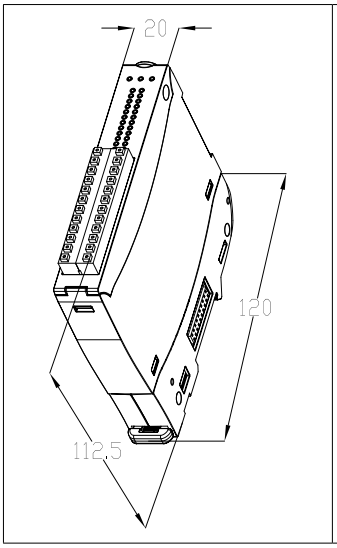


Once inserted, the inserts can be extracted and rotated as desired.

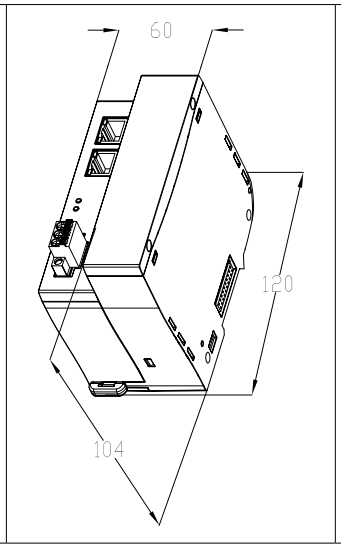
2.4. Mechanical dimensions

The mechanical dimensions of the product, without the DIN rail, may be seen in the image below.

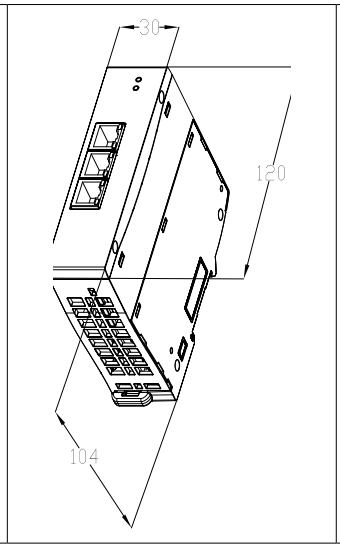
Full G3-xxxx Board



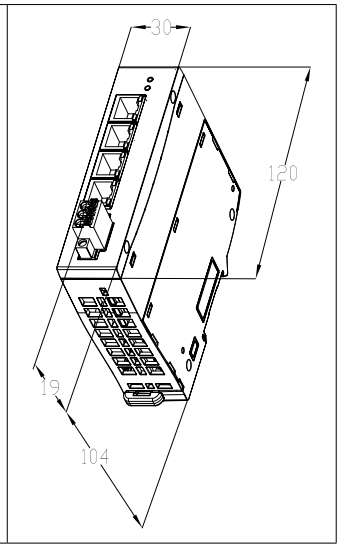
G3-ECAT hub head



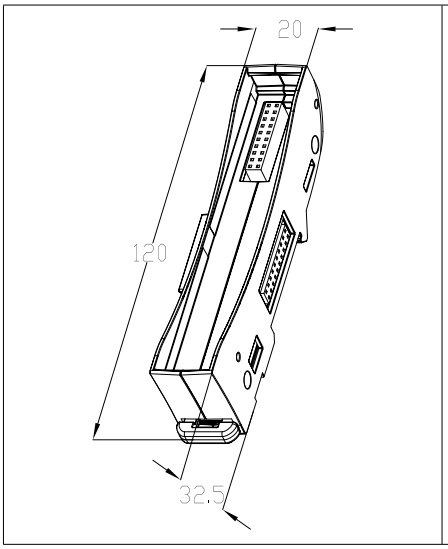
G3-JNC3



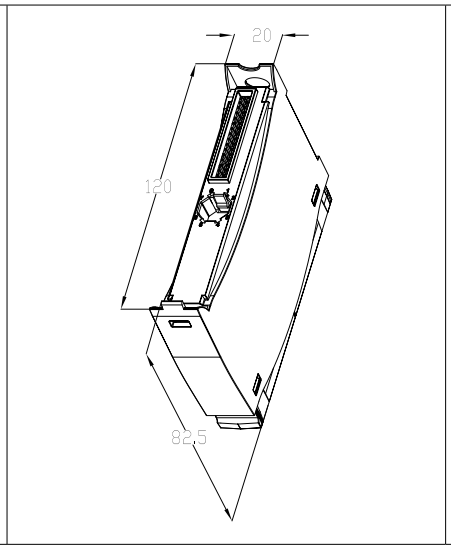
G3-JNC4



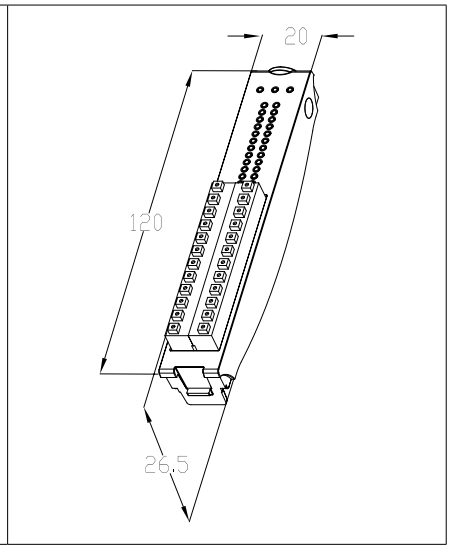
G3-BUS Base



G3-xxxx E Electronic board



G3-xxxx F Front



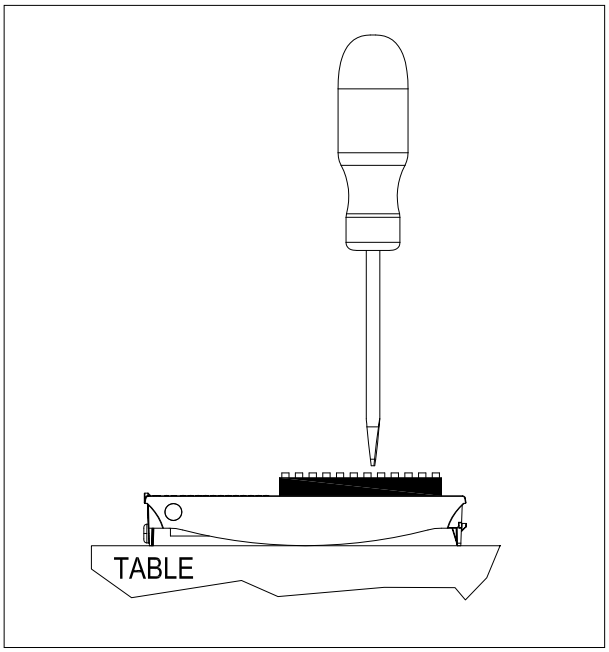
2.5. Front connector wiring

The connector can be wired both with the front coupled with the module and with the front detached from the module.
The front connector can be placed on a bench to facilitate wiring.
For wiring, both the use of NON terminated flexible electrical wire and flexible electrical wire terminated with a TIP are allowed.
Use unipolar flexible electric wire with maximum section of 1.50 mm² (AWG 16) with 8 - 9 mm strip length.
If a TIP is used, use a model with a section appropriate to the wire used and with a length of 8 - 9 mm.

To connect the wire **without TIP:**
press the button with a screwdriver insert the wire into the seat release the button.

To connect the wire **with TIP:**
push the tip directly into the seat
To disconnect the wire:
press the button with a screwdriver pull out the wire/tip
release the button

A pressed flexible wire can be used as an alternative to the TIP.

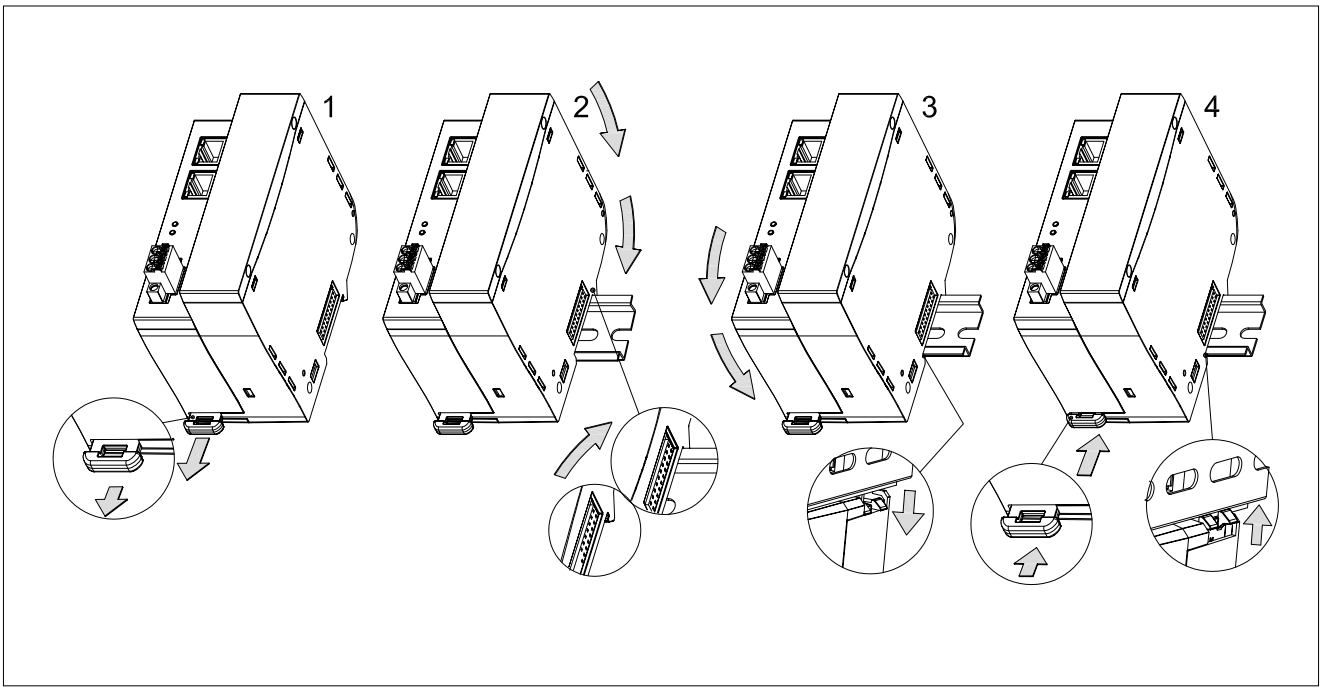


It is recommended NOT TO WELD the electric wire.
Minimum temperature rating of the cable to be connected to the field wiring terminals, 85 °C

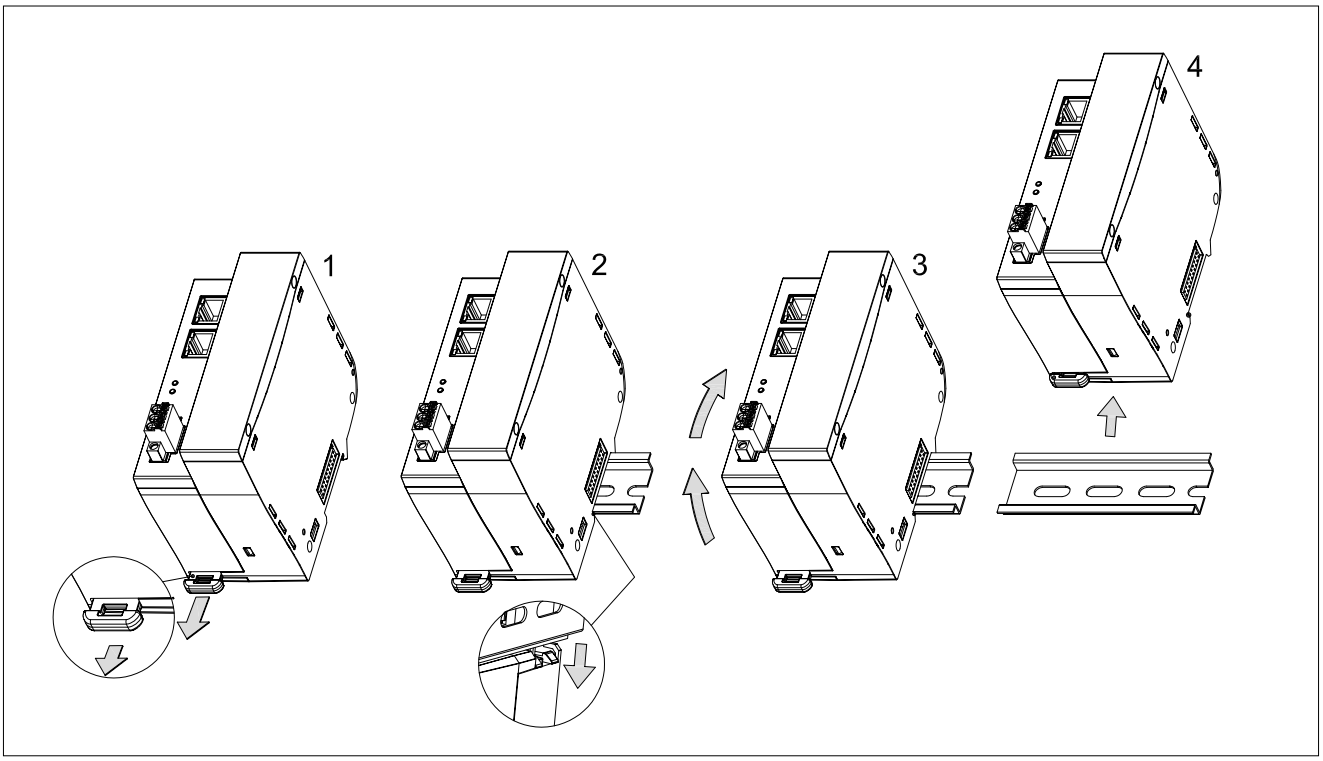
2.6. DIN rail mounting

2.6.1. G3-ECAT

To mount the G3-ECAT to the din bar, unclip the lower clip and leave it in the open stable position. Enter the top of the latch on the rail, rotate the board and place it on the DIN rail. Raise the lower clothespin slightly to free it and allow it to be hooked to the bar even in the lower part.

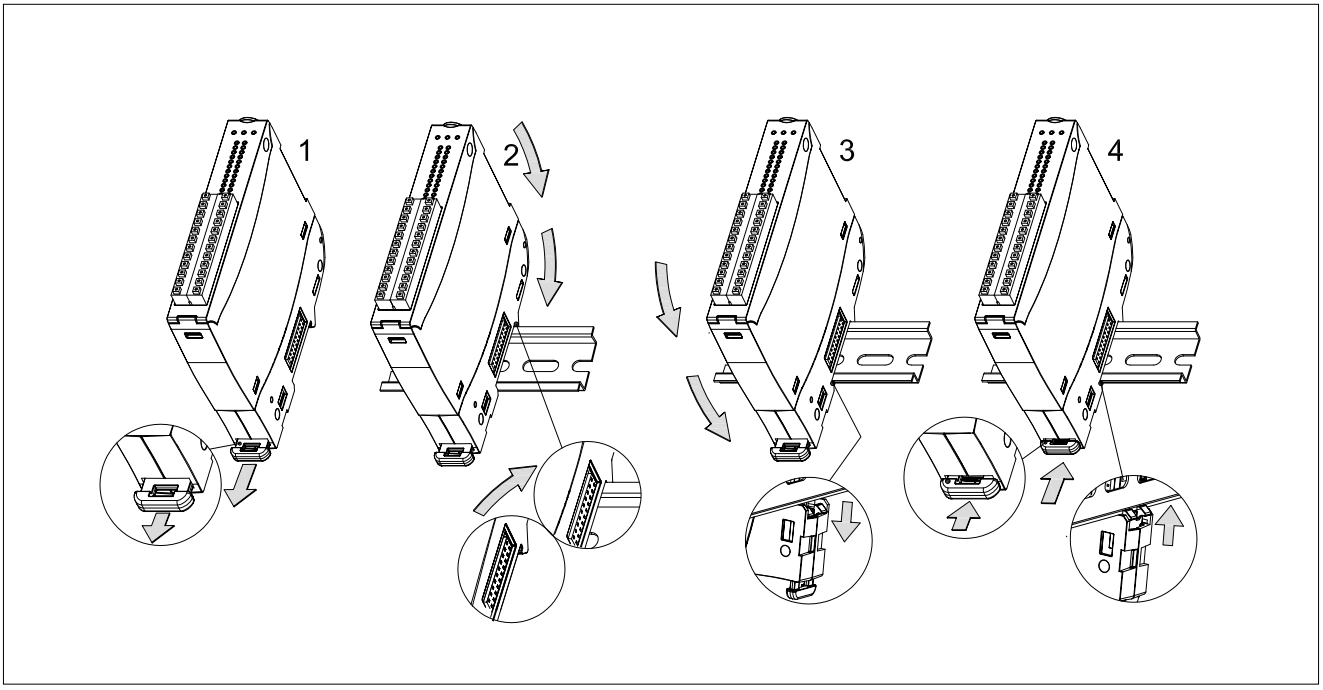


To remove the head the hub from the DIN rail, release the lower clip by slightly levering with a screwdriver and turn the board to release it.

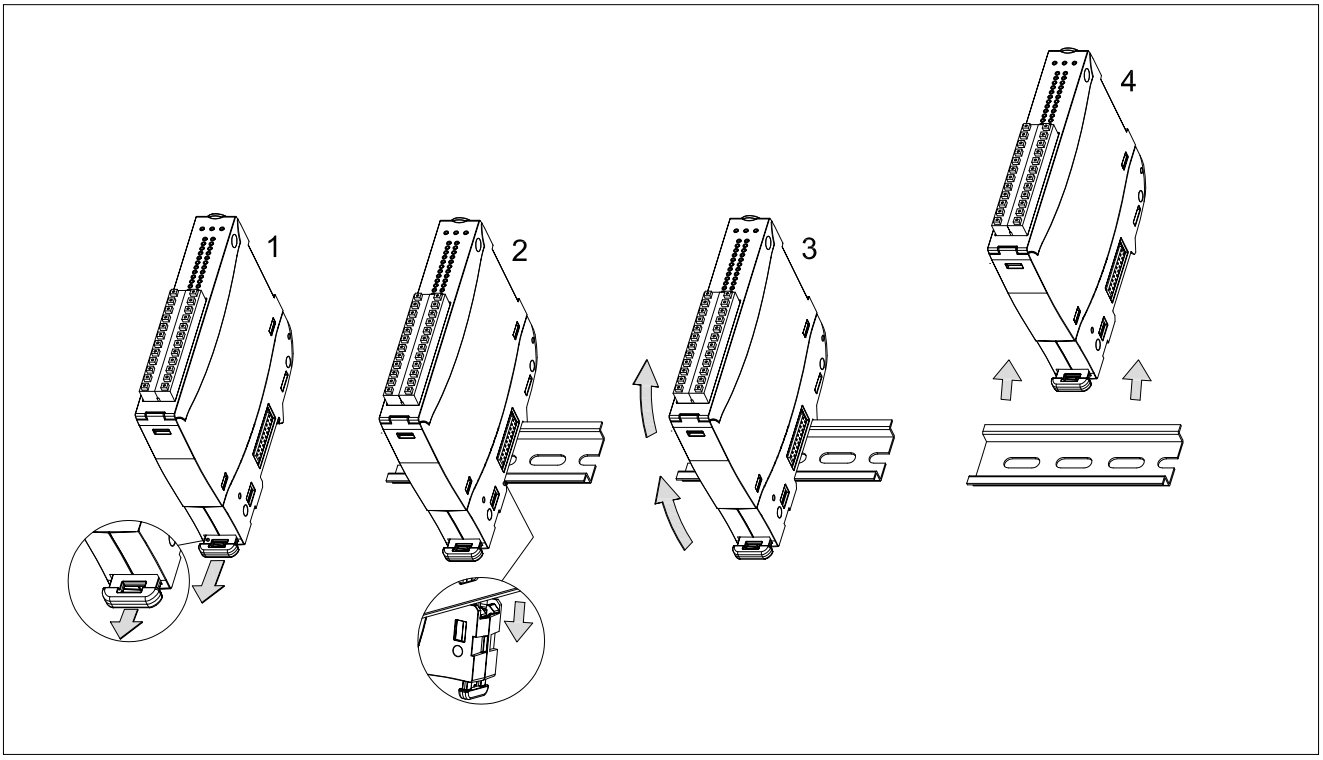


2.6.2. G3-xxxx (all models unless otherwise specified)

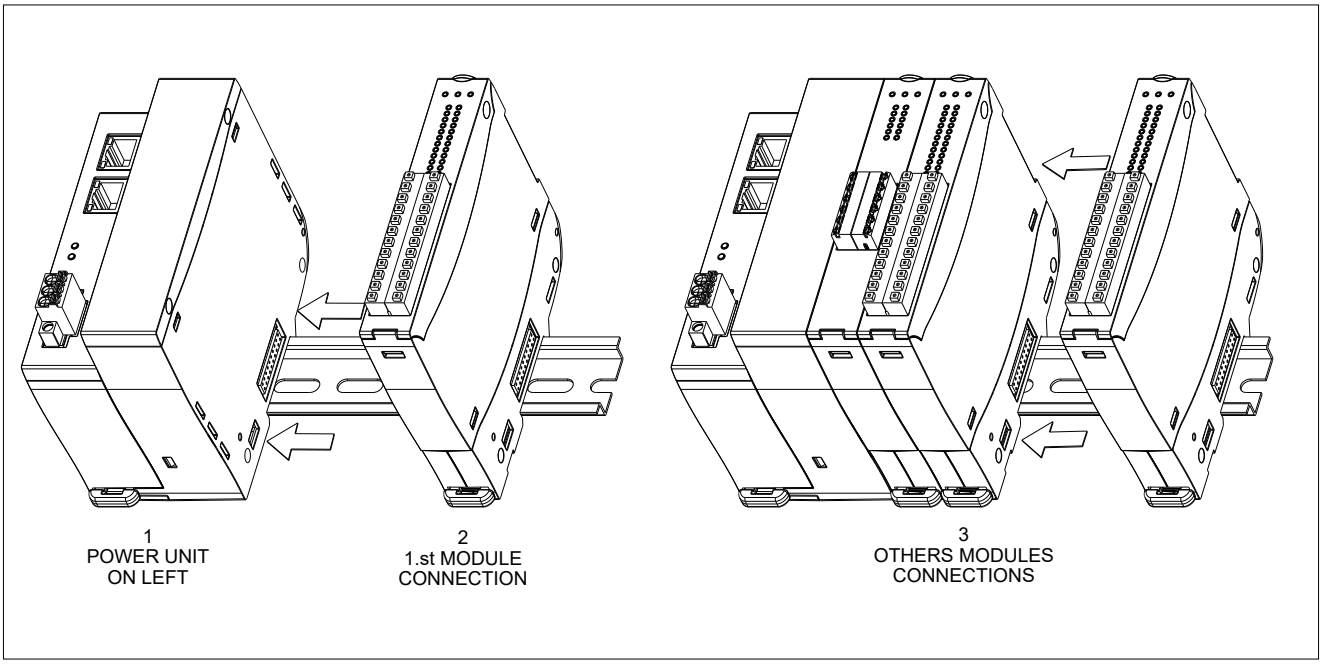
To mount the module to the din rail, unclip the lower clip and leave it in the open stable position. Insert the part top of the hook on the rail, rotate the board and place it on the DIN rail. Raise the lower clothespin slightly to free it and allow it to be hooked to the bar even in the lower part.

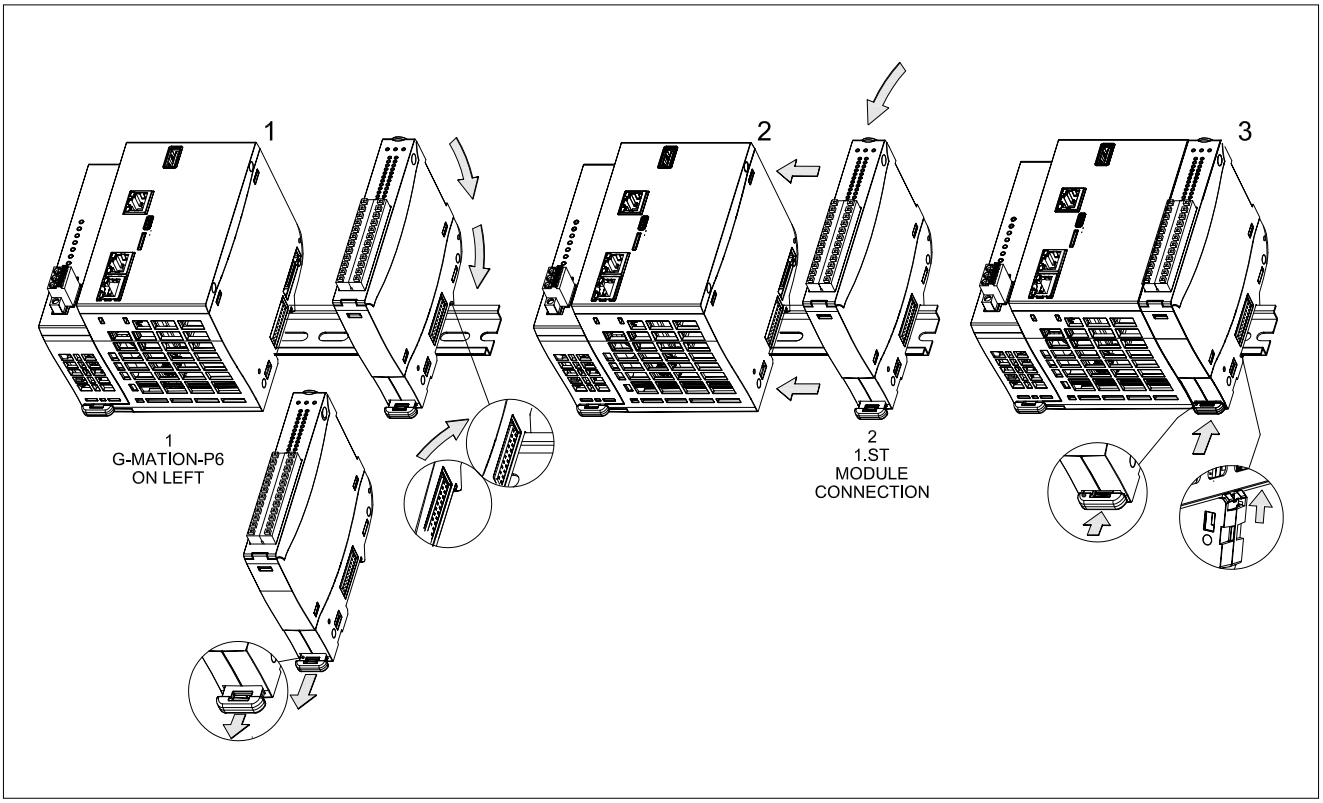


Remove the board from the DIN rail, release the lower clip using a screwdriver to lever it slightly, and turn the board to release it.

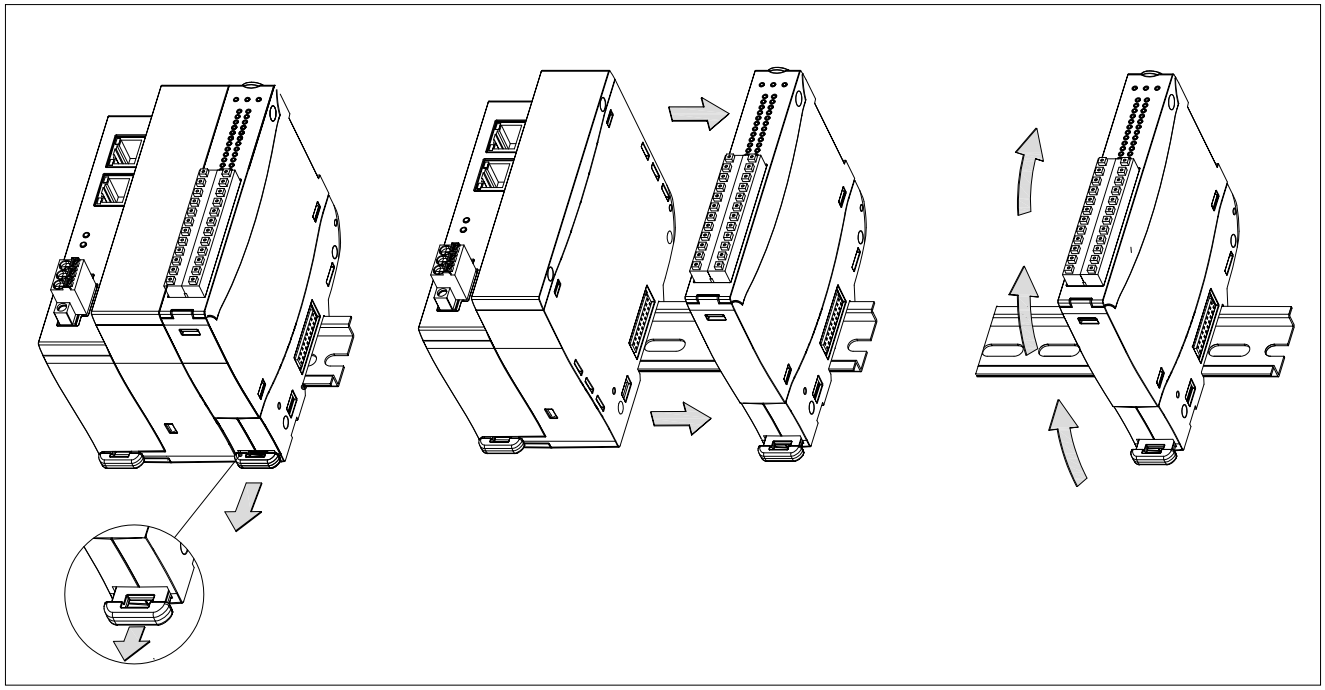


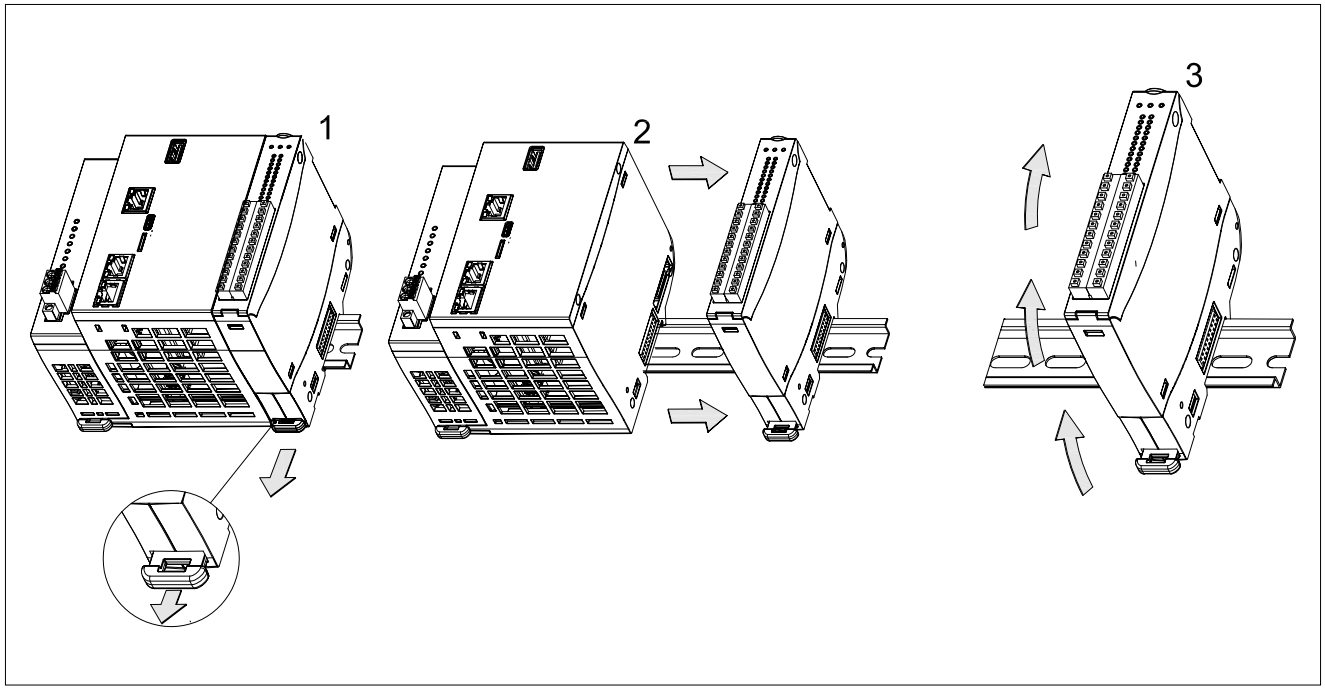
Once the board has been coupled, it is possible to secure the lower clip in the stable released position and slide it longitudinally on the rail until it is coupled to the previous board.





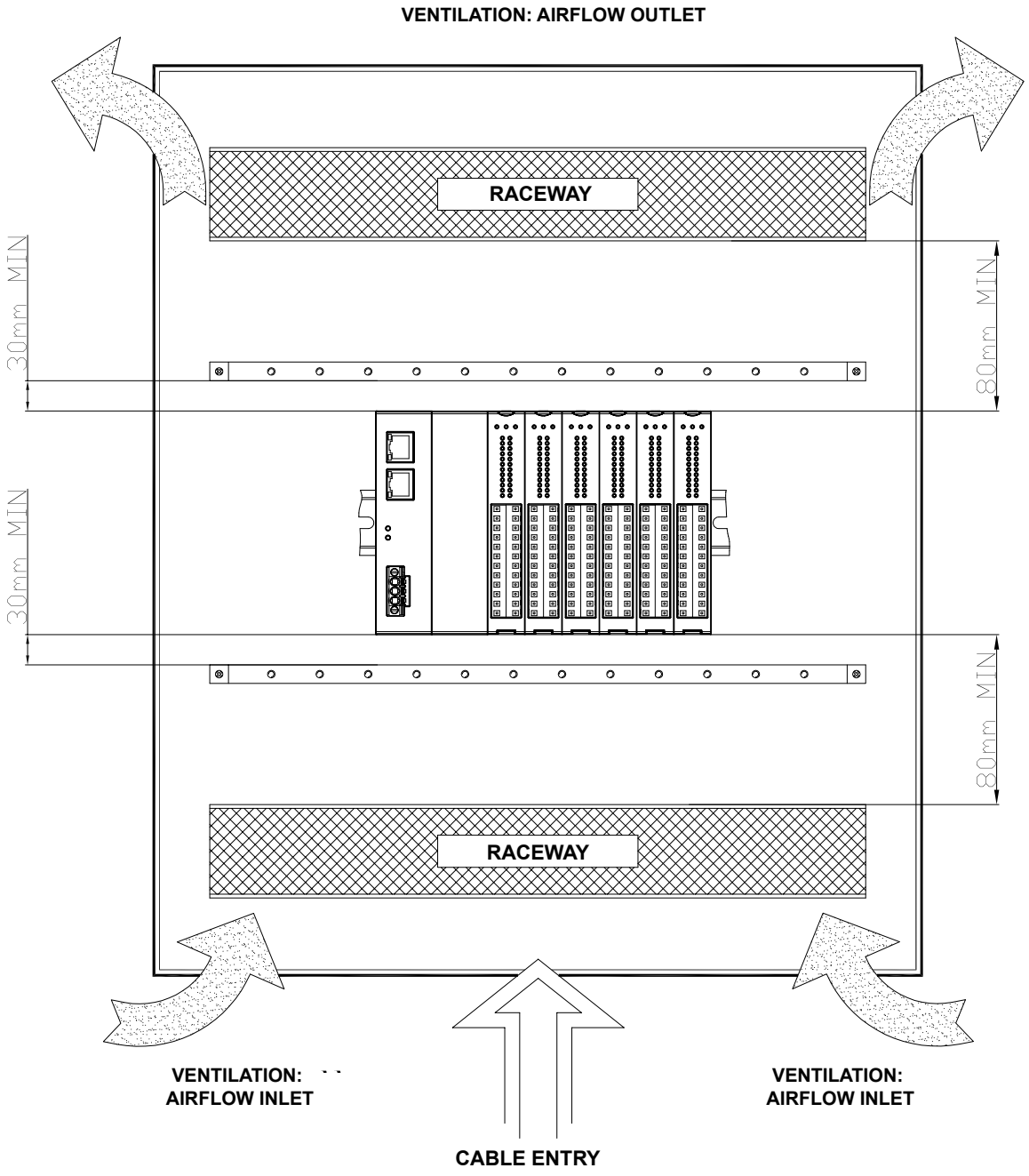
Once coupled, reinsert the lower clip so that the coupling with the DIN rail and the left board is firm and maintained by the force of the internal spring.
To release the board from the rack, use the lower clip and lock it in the stable released position. Slide the board to the right to separate it from the rack. Use the lower clip again and pull it so that you can lift the board from the din r.





2.7. Positioning

For the installation into an electrical cabinet of a G3 I/O rack, the ventilation distances as defined in the figure must be respected underlying.



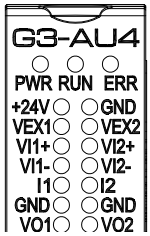
3. TECHNICAL SPECIFICATIONS

3.1. Board equipment

The **G3-AU4** module has 4 isolated universal analog inputs with 24 bit resolution. Can be used to read signals from various types of linear sensors, from retransmitting units, servocontrols, position, and weight systems.
Inputs can be software configurable as voltage (0…10V, ±10V), current (0…20mA, 4…20mA), TA (0…50mA rms), potentiometer (>1kΩ) or Strain Gauge (>1M Ω).
G3-AU4 can be used with all the G-Mation gateways and CPU's from which it receives power supply.
Sampling time for each G3-AU4 analog input is software configurable.

TECHNICAL DATA	
4 analog inputs	24 bit A/D conversion
Sample time	Programmable for 4 channels
Power supply	From G3-ECAT or G3-Px modules for control electronics, +24V±25%, 0.5Amax for field signals
Inputs type	Linear 0...10V, ±10V Linear 0...20mA, 4...20mA Potentiometer min. 1kΩ Differential for Strain Gauge TA 0…50mA rms (50-60Hz)
Input impedance	Potentiometer > 1MΩ Linear 0...10V, ±10V > 1MΩ Linear 0/4...20mA = 500Ω Strain Gauge > 1MΩ
Potentiometers power supply	4.096 V +_ 0.03%
Additional power supplies	Two 24Vdc output max 500 mA
Accuracy	Better than 0.1% at full scale over the entire temperature range -10°C to +55°C. 0,5% for TA input
Overvoltage Category	II
Power dissipation	3.6W
MECHANICAL DATA	
Dimensions	120x110x20 mm
Weight	150 g
Protection level	IP20 For UL: evaluated. Open type device
Connectors	Front 24 pin-5.08 mm pitch removable connection system with spring wire retention, no tool required to fix or remove wires
Attachment	Mechanically snaps onto DIN rail
ENVIRONMENTAL CONDITIONS	
Working temperature	-10...55°C
Storage temperature	-25...70°C
Humidity	max. 90% Rh not condensing
Pollution degree	2
Maximum altitude	2000 m

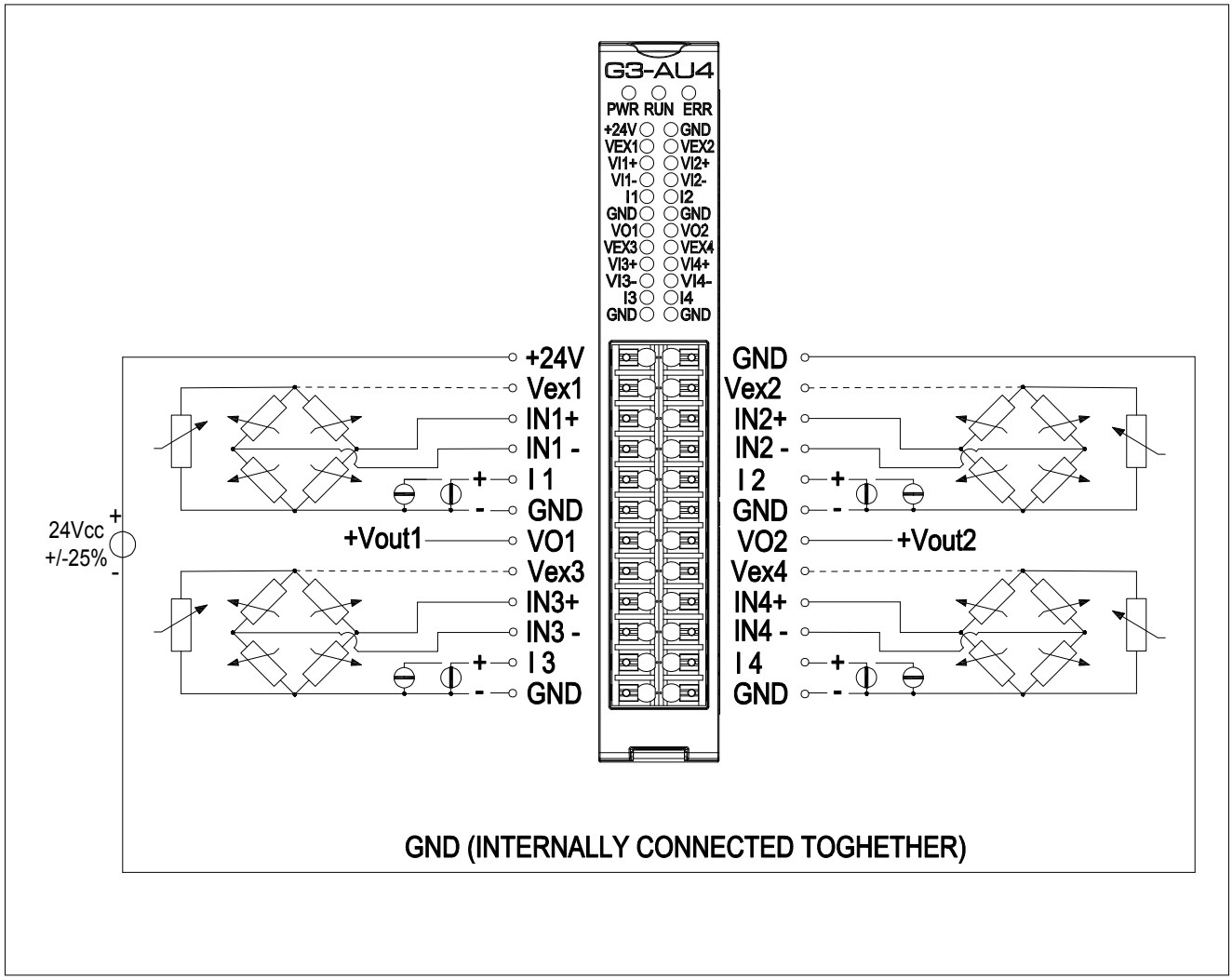
3.2. Meaning of LEDs

	ACRONYM	COLOR	LED STATUS	MEANING
MODULE DIAGNOSTICS 	**PWR**	GREEN	OFF	no power supply
			ON	power supply present
	RUN	GREEN	OFF	**INIT** or **BOOT** status
			Blinking: 2.5 Hz (Slow blinking)	**PRE-OPERATIONAL** status
			Single Flash: on 200 ms off 1000 ms (Single Flash)	**SAFEOP** status
			Flickering: 10 Hz (Fast flickering)	**BOOT** status
			ON	**OPERATIONAL** status
	ERR	RED	OFF	no error
			Blinking (Slow blinking)	configuration error
			Single Flash:	generic runtime error
			Double Flash	wdog on cyclic data.
			Flickering (Fast flickering)	error during the BOOTING PHASE
			ON	Slave specific error (ref. par.3.5)
IOs DIAGNOSTICS: 	**+24Vn(1...4)**	GREEN	OFF	Power supply ABSENT
			ON	Power supply PRESENT

If communication with the master is active, more information can be obtained from the objects in the module itself.

3.3. Connections

3.3.1. Front connections



For linear inputs 0-10V ±10V 0/4-20mA use 2 pin shielded cable with 1 square mm max. cross-section. Connect shiel-
ding directly to the grounding rod and as close as possible to the module. Potentiometers use 3 pin shielded cable with 1
square mm max. cross-section. Connect shielding to the grounding rod and as close as possible to the module.
Power supply 24 VDC ± 25% 500 mA max.

See paragraph “2.5. Front connector wiring” a pagina 12 of this manual for wiring modes

3.4. Resource software management

The G3-AU4 module resources are available through the objects described below, which are provided by the EtherCAT protocol according to directive ETG 5001.

All objects are made available to the master through the ESI file called:
Gefran G3-AU4 Vxx where xx is the version.

The file is available on the Gefran WEBSITE (www.gefran.com).

3.4.1. Effective Resolution as a Function of Data Rate and Gain

The device uses a 24-bit **delta-sigma** A/D converter with **Programmable Gain Amplifier (PGA)** and **programmable Data Rate**. The “theoretical” resolution is always 24 bits, but the **effective resolution** (bits truly usable above the noise floor) depends on the **Data Rate** and **Gain** settings, as shown in the following table.

DATA RATE (SPS)[1]	GAIN							
	1	2	4	8	16	32	64	128
2,5	24.4 (22.0)	24.5 (22.0)	24.2 (22.0)	24.3 (21.7)	23.7 (21.0)	23.1 (20.7)	22.4 (19.8)	21.5 (19.1)
5	24.0 (21.4)	24.0 (21.7)	23.9 (21.2)	23.6 (21.2)	23.2 (20.7)	22.6 (20.0)	21.9 (19.4)	20.9 (18.5)
10	23.5 (21.0)	23.5 (21.0)	23.3 (21.0)	23.3 (21.0)	22.8 (20.3)	22.2 (19.6)	21.4 (18.9)	20.5 (17.9)
16,6	23.1 (20.5)	23.1 (20.7)	23.1 (20.5)	22.8 (20.5)	22.5 (19.9)	21.8 (19.2)	20.9 (18.4)	20.1 (17.6)
20	23.0 (20.5)	22.9 (20.4)	22.9 (20.5)	22.7 (20.5)	22.3 (19.8)	21.7 (19.2)	20.8 (18.2)	20.0 (17.6)
50	22.4 (20.0)	22.3 (19.9)	22.4 (19.8)	22.1 (19.8)	21.8 (19.4)	21.1 (18.5)	20.1 (17.7)	19.4 (16.8)
60	22.3 (19.8)	22.2 (19.6)	22.2 (19.7)	21.9 (19.7)	21.6 (19.1)	20.8 (18.4)	20.0 (17.5)	19.2 (16.6)
100	22.0 (19.5)	21.9 (19.4)	21.8 (19.5)	21.6 (19.5)	21.2 (18.7)	20.5 (18.0)	19.7 (17.2)	18.8 (16.3)
200	21.4 (18.9)	21.5 (19.0)	21.3 (18.8)	21.1 (18.8)	20.7 (18.1)	20.0 (17.6)	19.1 (16.6)	18.3 (15.7)
400	21.0 (18.5)	20.9 (18.4)	21.0 (18.5)	20.6 (18.5)	20.2 (17.6)	19.6 (17.1)	18.7 (16.1)	17.9 (15.4)
800	20.4 (17.9)	20.4 (17.8)	20.3 (17.7)	20.1 (17.7)	19.8 (17.2)	19.0 (16.5)	18.2 (15.7)	17.4 (14.9)
1000	20.3 (17.7)	20.2 (17.6)	20.1 (17.7)	19.9 (17.7)	19.6 (17.0)	18.9 (16.3)	18.1 (15.6)	17.2 (14.7)
2000	19.7 (17.1)	19.8 (17.2)	19.6 (17.2)	19.4 (17.2)	19.0 (16.5)	18.3 (15.9)	17.6 (15.2)	16.7 (14.2)
4000	19.0 (16.3)	18.9 (16.4)	18.8 (16.2)	18.7 (16.2)	18.4 (15.9)	17.8 (15.3)	17.0 (14.5)	16.1 (13.6)

- **Data Rate (SPS)**
  The converter samples the signal at a very high frequency and then digitally averages the samples (oversampling). Reducing the data rate increases the number of averaged samples → **input noise decreases, and thus the effective resolution increases**.
  At high data rates (e.g., 1000–4000 SPS), the conversion is faster, but the noise is higher, and the number of useful bits is reduced.

- **Gain (PGA) - Settable only for Strain Gauge input**
  The PGA gain reduces the full-scale seen by the ADC (VREF/Gain). For a given input noise, a smaller full-scale means a finer quantization step → **a greater number of effective bits**, especially for small-amplitude signals.However, at higher gains, the internal noise of the PGA becomes predominant, and the resolution stops improving significantly.

By setting the Strain Gauge Factor (0x8002 : channel no.), the PGA value is automatically updated, based on the following relationships:

SG Factor (mV/V)	PGA Gain
2..6	128
8..14	64
16..30	32
32..62	16
64..124	8
126..248	4
250..256	2

In summary, **the resolution of our device is not fixed** but varies according to the combination of **Data Rate** and **Gain**:

- **Low Data Rate**
  For the same gain, a lower data rate allows for greater digital averaging of the signal → **lower noise and higher effective resolution**, ideal for slow but highly precise measurements..
- **High Data Rate**
  Increasing the data rate results in a faster measurement update → **noise increases and effective bits decrease**, suitable when speed is the priority over maximum precision.
- **Low PGA**
  With low gains, the full-scale is wider → **greater dynamic range but a coarser quantization step**; the effective resolution is good for relatively large signals, but less so for very small signals.
- **High PGA**
  With high gains, the full-scale narrows → **greater sensitivity to small signals and a potential increase in effective bits**, but the contribution of the PGA's internal noise also increases; thus, the resolution improvement tends to saturate at the highest gains
-

The table "Effective Resolution vs. Data Rate and Gain" summarizes these trade-offs and indicates, for each setting, how many useful measurement bits are available.

3.4.2. Digital filters management

In addition to analog anti-aliasing filtering, the module provides **two software-configurable digital filters**, which can be activated individually or in cascade:

- **IIR Filter (Low-Pass)**

  The IIR filter performs a **weighted average** between the current value and the previous value. In practice, it "dampens" high-frequency noise and small measurement oscillations. The parameter **IIR_channel_no.** sets the **intensity of the filtering**:

  - **Low values** → More **reactive** signal, but noisier.
  - **High values** → More **stable** signal, but with a greater **delay** in the response.

  It is recommended for quantities that change slowly (force, pressure, position, etc.) when a smooth reading is desired.

The values and behavior of the IIR filter, depending on the configuration of the register **0x800A : channel_no.**, are reported below:

Filter Level	Normalized fc	fc [Hz] @ 1000 SPS	fc [Hz] @ 2000 SPS	fc [Hz] @ 4000 SPS
1	0,110318	110,32	220,64	441,27
2	0,045786	45,79	91,57	183,14
3	0,021252	21,25	42,5	85,01
4	0,010272	10,27	20,54	41,09
5	0,005053	5,05	10,11	20,21
6	0,002506	2,51	5,01	10,03
7	0,001248	1,25	2,5	4,99
8	0,000623	0,62	1,25	2,49

- **FIR Filter (Comb Filter)**
  The implemented FIR filter is a **comb type**: it compares the current sample with the one acquired a few samples earlier.

  This type of filter **markedly attenuates signal components that have a regular period** (offset, slow drift, or **periodic disturbances related** to the machine cycle / power grid), leaving the rest of the spectrum almost unchanged.

  It is particularly useful when the measurement is affected by a **repetitive disturbance** at a known or nearly constant frequency. Given the sampling frequency (Data Rate l SPS), and by entering the parameter **FIR_channel_no**. (Register: **0x800B : channel_no.**), the system imposes the **frequency spacing** of the Notch filter at :

$$f_{\text{notch},k} = k \cdot \left(\frac{f_s}{M}\right) \text{ per } k = 0, 1, 2, \ldots$$

With **M** in this case, for the purpose of simplifying the equation, being equal to the value of **FIR_channel_no**.

3.4.3. Module Objects

Module information:

INDEX	SUB.	STORE	NAME	MAP	TYPE	ACCESS	DEFAULT / NOTE
0x1000	0	No	Device type	No	UDINT	RO	0x0001389 5001
0x1001	0	No	Error Register	No	USINT	RO	0x00
0x1008	0	No	Device Name	No	STRING	RO	G3-AU4
0x1009	0	No	Manufacturer Hardware version	No	STRING	RW	1.0
0x100A	0	No	Manufacturer Software version	No	STRING	RO	1.0.0
0x1018	0	No	Objects number	No	USINT	RO	4
	1	No	Vendor Id	No	UDINT	RO	0x0000 0093 (Gefran)
	2	No	Product Code	No	UDINT	RO	0x00000BBD (3005)
	3	No	Revision Number	No	UDINT	RO	0x0000 0001
	4	No	Serial Number	No	UDINT	RW	0x0000 0000 product serial number

3.4.4. IOs managements

INDEX	SUB INDEX	NAME	PDO MAP	TYPE	ACCESS	Default / Note
0x6000	0	Objects number	No	USINT	RO	5
	1	Analog Input 1	Yes	DINT	RO OP	**IN -10..10 V:** -10 V = -8388608 [-2^23]; 10 V = 8388607 [2^23-1] **IN 0..10 V:** 0 V = 0; 10 V = 16777215 [2^24-1] **IN 0.. 20 mA / 4..20 mA:** 0 mA = 0; 20 mA = 16777215 [2^24-1]
	2	Analog Input 2	Yes	DINT	RO OP	
	3	Analog Input 3	Yes	DINT	RO OP	
	4	Analog Input 4	Yes	DINT	RO OP	

Value read from analog inputs

INDEX	SUB INDEX	NAME	PDO MAP	TYPE	ACCESS	Default / Note
0x6001	0	Objects number	No	USINT	RO	5
	1	TRMS Input 1	Yes	DINT	RO OP	**Current transformer 0..50mA rms:** 0 mA = 0; 50 mA = 16777215 [2^24-1]
	2	TRMS Input 2	Yes	DINT	RO OP	
	3	TRMS Input 3	Yes	DINT	RO OP	
	4	TRMS Input 4	Yes	DINT	RO OP	

True RMS reading in case of CT input

3.4.5. IOs configuration objects

Input type

INDEX	SUB INDEX	NAME	PDO MAP	TYPE	ACCESS	DEFAULT / NOTE
0x8000	0	Objects number	No	USINT	RO	17
	1	Analog Input Type 1	No	USINT	RW	0
	2	Analog Input Type 2	No	USINT	RW	0
	3	Analog Input Type 3	No	USINT	RW	0
	4	Analog Input Type 4	No	USINT	RW	0

Settable values:
0x00: -10V..10V
0x01: 0..10V
0x02: 0..20mA
0x03: 4..20mA
0x04: Current Transformer
0x05: Potentiometer
0x06: Strain Gauge

Input sampling rate

INDEX	SUB INDEX	NAME	PDO MAP	TYPE	ACCESS	DEFAULT / NOTE
0x8001	0	Objects number	No	USINT	RO	17
	1	Sample Rate 1	No	USINT	RW	0
	2	Sample Rate 2	No	USINT	RW	0
	3	Sample Rate 3	No	USINT	RW	0
	4	Sample Rate 4	No	USINT	RW	0

Settable values:
0x00: 2.5 SPS
0x01: 5 SPS
0x02: 10 SPS
0x03: 16.6 SPS
0x04: 20 SPS
0x05: 50 SPS
0x06: 60 SPS
0x07: 100 SPS
0x08: 200 SPS
0x09: 400 SPS
0x0A: 800 SPS
0x0B: 1000 SPS (default)
0x0C: 2000 SPS
0x0D: 4000 SPS

Strain Gauge Gain Factor

INDEX	SUB INDEX	NAME	PDO MAP	TYPE	ACCESS	DEFAULT / NOTE
0x8002	0	Objects number	No	USINT	RO	17
	1	Strain Gauge Factor 1	No	USINT	RW	0
	2	Strain Gauge Factor 2	No	USINT	RW	0
	3	Strain Gauge Factor 3	No	USINT	RW	0
	4	Strain Gauge Factor 4	No	USINT	RW	0

Settable values:
0x00: 2..6 mV/V (default)
0x01: 8..14 mV/V
0x02: 16..30 mV/V
0x03: 32..62 mV/V
0x04: 64..124 mV/V
0x05: 126..248 mV/V
0x06: 250..256 mV/V

IIR Filter

INDEX	SUB INDEX	NAME	PDO MAP	TYPE	ACCESS	DEFAULT / NOTE
0x800A	0	Objects number	No	USINT	RO	17
	1	IIR_1	No	USINT	RW	0
	2	IIR_2	No	USINT	RW	0
	3	IIR_3	No	USINT	RW	0
	4	IIR_4	No	USINT	RW	0

Settable values:
0x00: IIR disabled (default)
0x01: Level 1
0x02: Level 2
0x03: Level 3
0x04: Level 4
0x05: Level 5
0x06: Level 6
0x07: Level 7
0x08: Level 8

FIR Filter

INDEX	SUB INDEX	NAME	PDO MAP	TYPE	ACCESS	DEFAULT / NOTE
0x800B	0	Numero di oggetti	No	USINT	RO	17
	1	FIR_1	No	USINT	RW	0
	2	FIR_2	No	USINT	RW	0
	3	FIR_3	No	USINT	RW	0
	4	FIR_4	No	USINT	RW	0

Filter lenght FIR [0..64]
Notify Internal Errors Enable

INDEX	SUB INDEX	NAME	PDO MAP	TYPE	ACCESS	DEFAULT / NOTE
0x8010	0	Notify Internal Errors Enable	Si	USINT	RO	17

Enable of registero 0xA001 Internal Errors
Possible values:
Off (default)
On

3.4.6. Control objects

INDEX	SUB.	STORE	NAME	MAP	TYPE	ACCESS	DEFAULT / NOTE
0x9000	0	No	Device Code	No	UINT	RO	0x0BC9
0x9001	0	No	Hardware Revision	No	USINT	RW	0x02
0x9002	0	No	Firmware Version	No	UINT	RO	0x0100
0x9003	0	No	Serial Number	No	DINT	RW	0x00
0x9004	0	No	Order Code	No	STRING(7)	RW	F092705

3.5. Alarms management

3.5.1. Alarm Status

INDEX	SUB.	NAME	MAP	TYPE	ACCESS	DEFAULT / NOTE
0xA000	0	Alarm Status	Si	USINT	RO	0x00000000

The following table shows the meanings of the alarm bits.

Bits 31:28				Bits 27:24				Bits 23:20				Bits 19:16			
In4	In3	In2	In1	In4	In3	In2	In1	In4	In3	In2	In1	In4	In3	In2	In1
Not connected - potentiometer				Over TRMS - current transformer				Open circuit - 4..20mA				Over current - 0/4..20mA			

Bits 15:12				Bits 11:8				Bits 7:4				Bits 3:0			
In4	In3	In2	In1	In4	In3	In2	In1	In4	In3	In2	In1	In4	In3	In2	In1
Under voltage - 0..10V				Over voltage - 0..10V				Under voltage -10..10V				Over voltage - 10..10V			

3.5.2. Internal Errors

INDEX	SUB.	NAME	MAP	TYPE	ACCESS	DEFAULT / NOTE
0xA001	0	Internal Errors	Si	USINT	RO	0x00000000

The following table shows the meanings of the alarm bits.

Bits 31:28				Bits 27:24				Bits 23:20				Bits 19:16			
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Not used				Not used				Not used				Not used			

Bits 15:12				Bits 11:8				Bits 7:4				Bits 3:0			
0	0	0	0	0	0	0	0	0	0	0	0	0	C	P	I
Not used				Not used				Not used				Flash CRC32 error: I = Information P = Parameters C = Calibration			

3.5.3. Emergency messages

ERROR_CODE	ERROR_REGISTER	Alarm Status	Spare_0
0xFF00	0x80	Mappatura del registro 0xA001	00

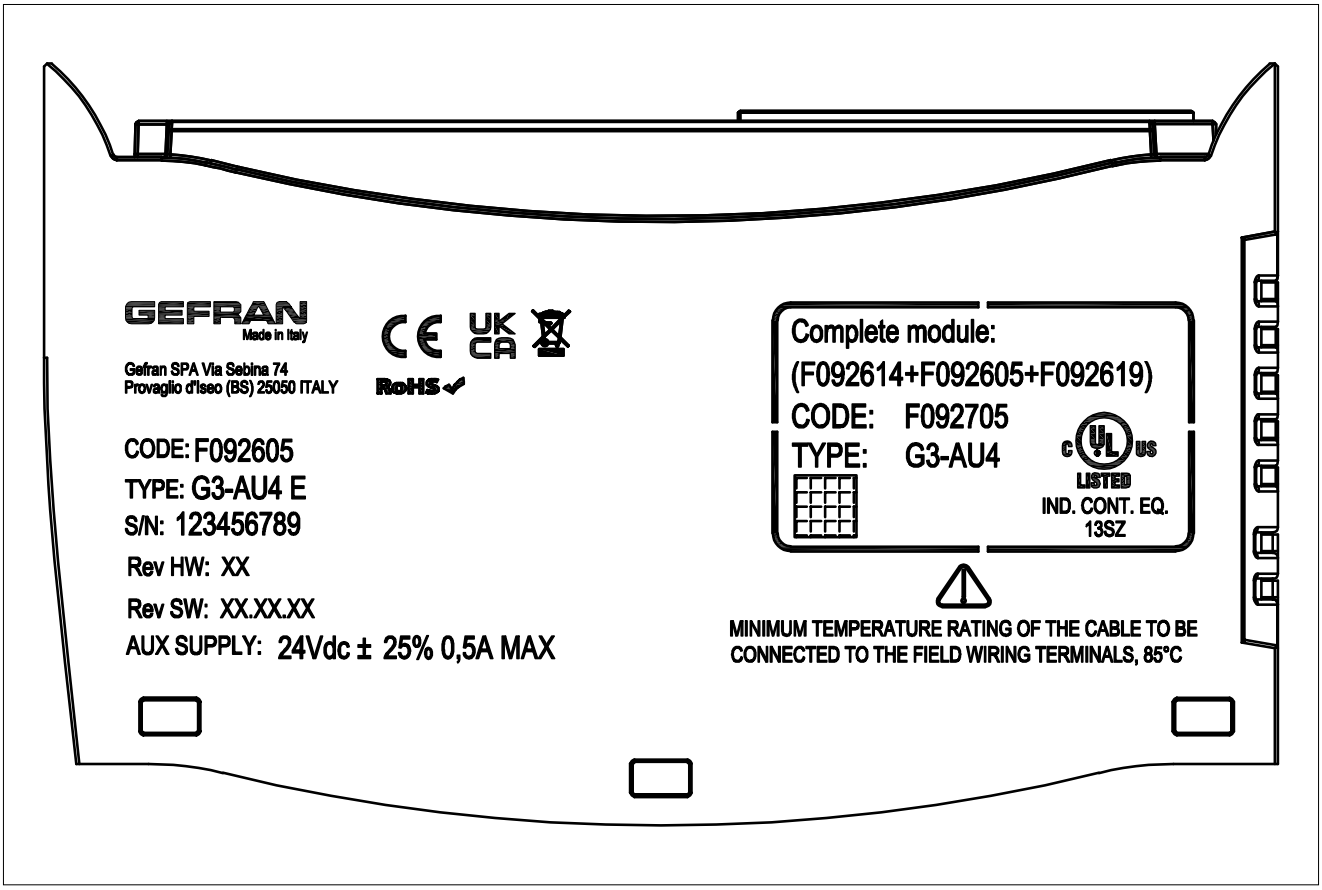
Example:
FF00,80,00,00,00,01,00
Error code : 0XFF00 (device specific)
Error register : 0X80 (manufacturer specific)
Alarm Status [31..0]: 0x00000001 over voltage -10V..+10V

4. ACRONYM AND ORDER CODE

COMPLETE MODULE	G3-AU4	F092705
Front	G3-AU4 F	F092619
Electronic module	G3-AU4 E	F092605
Bus	G3-BUS	F092623

5. MARKING

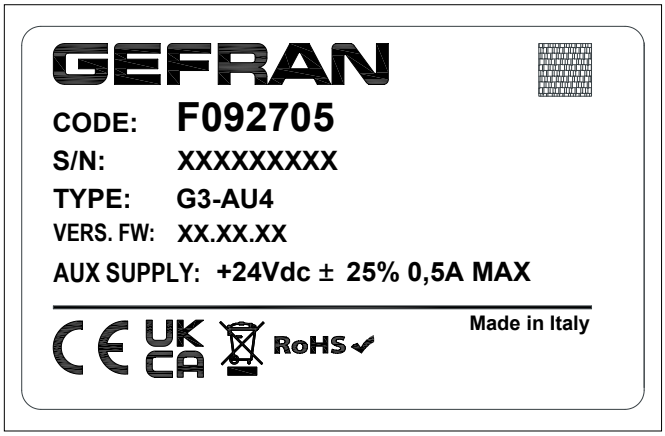
Every module contain the datas of every module part and the full module.



The following information may be found on the label:

- CODE: product code
- S/N: product serial number
- TYPE: product name / description
- HW: hardware version 1 .. 99

- GEFRAN logo
- certifications
- logo specifying product disposal



This symbol present on the product label stands for further indications on product manual. For correct and sale installation, follow the instructions and observe the warnings contained in this manual. No hazards shall arise by any reasonably foreseeable misuse in a way not intended, and not described in this manual. The complete manual is available for download from the website www.gefran.com. UL file number E-198546.

Certifications

CE	This device conforms to European Union Directive 2014/30/EU and 2014/35/EU as amended with reference to generic standards: **EN 61000-6-2** (immunity in industrial environment) **EN 61000-6-4** (emission in industrial environment) - **EN 61010-1** (safety regulations).
c UL us	cULus listed, Conformity UL61010-1 - File: E198546

6. DISPOSAL

The product must be disposed of in accordance with the regulations in force.
Some of the components used in the devices can cause damage to the environment if incorrectly disposed.

Pursuant to art. 26 of Legislative Decree 14 March 2014, no. 49 “Implementation of Directive 2012/19/EU on waste from electrical and electronic equipment (WEEE)”.

The symbol showing a crossed-out wheeled bin on equipment or its packaging indicates that the product must be collected separately from other waste at the end of its useful life.

By collecting the disused equipment separately, it can be recycled, treated or disposed of in an environmentally friendly manner, thus helping to prevent the environment and public health from being affected negatively and enabling reuse and/or recycling of the materials forming the equipment.

GEFRAN