

R-MIX

MODULE WITH 8 DIGITAL INPUTS + 8 DIGITAL OUTPUTS
+ 4 ANALOG INPUTS + 2 ANALOG OUTPUTS 16 Bit + 2 TA

Main applications

Connection of:

- Proximity sensors
- Control devices
- ON/OFF signals from electronic devices or from auxiliary contacts
- Single Ended and Push-Pull encoders
- Thermocouples and resistance thermometers
- Strain Gauges and potentiometers
- Current transformer (CT)

Control of:

- Solid state actuators (solid state relays and power units) with digital or analog control
- Electronic drives and devices (including with PWM or frequency control)
- Pneumatic and hydraulic actuators
- Electromechanical contactors
- Light signals
- Proportional valves



Main characteristics

- Optically-isolated I/O
- 8 configurable digital inputs 24VDC $\pm 25\%$
- 8 configurable digital outputs 24VDC $\pm 25\%$
- 4 analog inputs, configurable via software (V, I, TC, RTD, potentiometer strain-gauge) 16 bit A/D conversion
- 2 configurable analog outputs ($\pm 10V$, $\pm 20mA$) 16 bit D/A conversion
- 2 CT inputs 16 bit A/D conversion
- Protected against polarity inversion, overload and overtemperature
- LED power supply diagnostics, I/O, module status and alarm
- Extractable connectors supplied

PROFILE

The R-MIX module is equipped with a microprocessor with digital inputs/outputs and analog inputs/outputs, useful for configuring a system with a single board and/or when you want to save space on the back-plane.

It has optically-isolated 24 VDC PNP digital inputs and outputs.

Each input is protected against polarity inversion and each output is protected against short circuit, overload, and overtemperature.

An LED lights to signal presence of the input and/or output.

It controls 4 optically-isolated analog inputs, configurable via software, for thermocouples and resistance thermometers, voltage (0-10V and 0-2.5V), current (0-20mA), strain-gauge and potentiometer.

A/D conversion is 16 bit.

The conversion system is sequential on 4 channels.

It also controls 2 optically-isolated configurable 16 bit analog outputs, $\pm 10V$ or $\pm 20mA$.

It has electronic protection against short circuit and overload, and a feedback

circuit for diagnostics of channel function.

R-MIX also has 2 isolated inputs for CT current transformer with 16 bit resolution.

The board has advanced functions for digital inputs and digital outputs.

Digital inputs are configurable as fast counters, for encoder reading or for measuring period, frequency, duty cycles.

Digital outputs are configurable as PWM or frequency generator.

The module installs on the RBUS(x) back-plane, from which it is powered.

TECHNICAL DATA

Digital inputs

- 8 optically-isolated digital inputs at 24VDC $\pm 25\%$ with > 2KV isolation
- Maximum input voltage: 32V 25mA
- Polarity inversion protection
- Maximum voltage for "0" (input OFF) = 5Vdc
- Minimum voltage for "1" (input ON) = 11VDC compatible with devices type 1,3.
- Inputs 1 to 4 with 50 kHz pass band
- Inputs 4 to 8 with 5 kHz pass band
- Board has 3 counting units assignable to inputs 1 to 4 configurable as:
 - Bi-directional, mono-directional encoder with or without zero mark and internal speed calculation.
 - Pulse counter
 - Measurement of period, frequency, duty cycle
 - Measurement of high/low pulse duration

Digital outputs

- 8 optically-isolated PNP outputs at 24VDC $\pm 25\%$ with > 2KV isolation
- Organization: 1 group of 8 outputs
- Output power supply: 24VDC $\pm 25\%$
- Max. current for 8 outputs: 6A
- Max. current for group of 4 contiguous outputs (1...4 / 5...8): 3A
- Maximum current per output: 1A,
- Output overload protection trips at 1.2A.

- Overvoltage on output for 1ms max. 1kV
- Outputs 1 and 2 configurable in PWM (10 bit resolution) and in frequency (32 bit resolution).
 - Selectable PWM period: 10s 5s, 2s, 1s, 10ms, 4ms, 2ms, 1ms.
 - Independent frequency generator for each channel, max. frequency 10kHz, min. frequency 0.1Hz settable in steps of 0.01Hz

Analog inputs

- 4 optically-isolated inputs with >2KV isolation and 16 bit A/D conversion. Inputs are configurable via software as follows:
 - Linear 0..10V (input impedance >1M Ω)
 - Linear 0..2.5V (input impedance >1M Ω)
 - Linear 0..20mA (input impedance 125 Ω)
 - Potentiometer (input impedance >1M Ω)
 - Differential 0..60mV (input impedance >1M Ω)
 - Differential for strain-gauge 0..25mV (input impedance >1M Ω)
 - Differential for strain-gauge 0..100mV (input impedance >1M Ω)
 - Thermocouple (J,K,R,S,T) with internal software compensation of cold junction. (input impedance >1M Ω)
 - Resistance thermometer PT100 (input impedance >100K Ω)
 - Resistance thermometer PT1000 (input impedance >100K Ω)

Note: if one of the four input channels is set as Pt1000, Pt100 and strain-gauge 0..25mV cannot be used on the other channels.
- 2 inputs 0..50mA for current transformer (CT) with > 2KV isolation, 16 bit A/D conversion and input impedance of 50 Ω
- Linearity greater than 0.5%

Analog outputs

- 2 optically-isolated outputs with > 2KV isolation and 16 bit D/A conversion. Outputs are configurable via software:
 - Linear \pm 10V max 15mA
 - Linear \pm 20mA, max 600 Ω load
- Linearity greater than 0.5%
- Settling time 100 μ s max
- Output overload protection trips 16..25mA.
- Open circuit signal for output in current.

- Feedback circuit for diagnostics of channel.

Power supplies

- Power supply of module via backplane R-BUS(x) 3.3V
- Power supply I/O 24Vdc \pm 25% max 200mA + load current of outputs (external, to be supplied on terminals). Power supply is distributed internally to the various channels.
- Power supply for strain-gauge supplied by module 10V max 150mA (total for all channels). Becomes 3.3V if a Pt1000 is configured.
- Power supply for potentiometer supplied by module 10V max 150mA (total for all channels). Becomes 3.3V if a Pt1000 is configured.

Diagnostics

- Yellow LED: presence of 24VDC external power supply
- Green LED: digital input ON
- Green LED: digital output ON
- Green RUN LED flashing:
 - Low frequency module awaiting configuration (not operative)
 - High frequency module operative
- Red LED: module in alarm. The alarm is active if at least one of the following occurs:
 - Short circuit or overload on digital outputs.
 - Short circuit or overload on analog outputs configured in voltage.
 - Open circuit or load with impedance exceeding limit on analog outputs in current.
 - Malfunction of microprocessor.

With the red LED ON, the digital and analog outputs are reset and the module fault is signaled to the master.

MECHANICAL CHARACTERISTICS

Dimensions: 92x90x25.4mm
 Weight: 120g.
 Fastening: snaps on R-BUS(x)
 Protection level: IP20
 Connector: 8 pin female with spring lock
 Connector: 36 pin female with spring lock

AMBIENT CONDITIONS

Working temperature: 0...50°C

Storage temperature: -20...70°C

Humidity: max. 90% Ur non-condensing

ORDER CODE

Module code **R-MIX** **F045312** Code

INSTALLATION AND CONNECTIONS

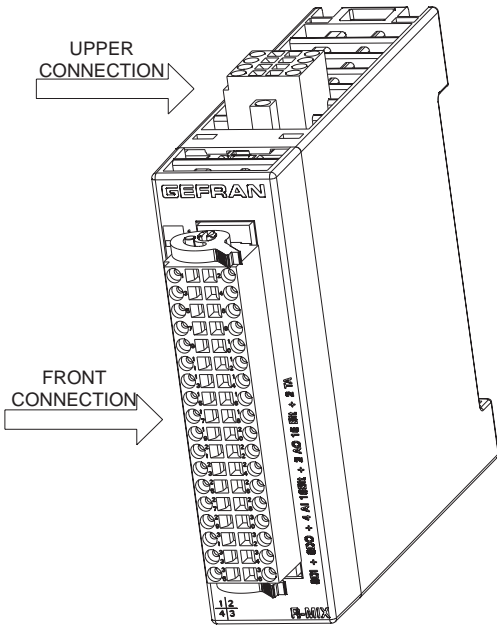
The connections of the module call for:

External power supplies:

- 24VDC $\pm 25\%$ 200mA max. plus the current needed to load the outputs. Use unipolar cable with max section 1 mm². Do not attach lug.

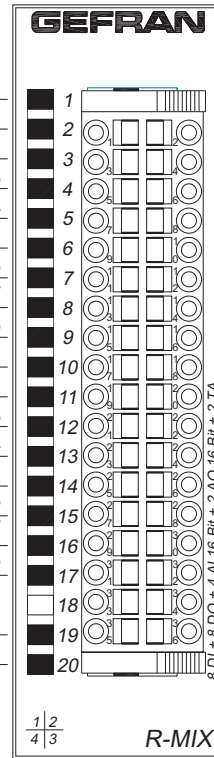
Transducer inputs:

- Potentiometer: use 3-pole shielded cable with max section 0.5 mm². Do not attach lug. Connect shield directly to ground plate and as close as possible to the module.
- Thermocouple: In case of isolated thermocouples, ground the negative pole of the input as close as possible to the module. Do not attach lug.
- Strain-gauge: use 4 or 6-pole shielded cable with max section 0.5 mm². Do not attach lug. Connect shield directly to ground plate and as close as possible to the module. Use external calibration wires to calibrate the transducer.
- Current transformer (CT)



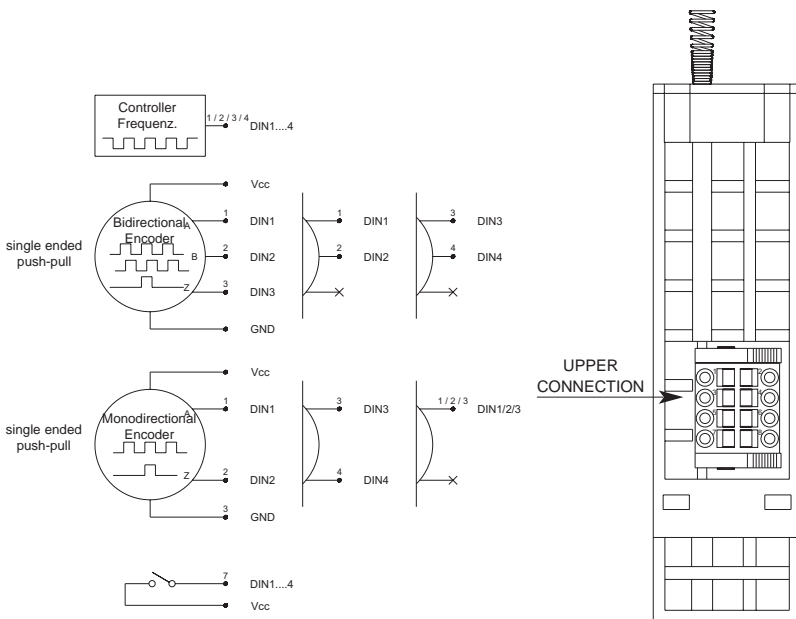
Yellow led POWER +24V in

- Green led DIN1
- Green led DIN2
- Green led DIN3
- Green led DIN4
- Green led DIN5
- Green led DIN6
- Green led DIN7
- Green led DIN8
- Green led Out1
- Green led Out2
- Green led Out3
- Green led Out4
- Green led Out5
- Green led Out6
- Green led Out7
- Green led Out8
- Green led RUN
- Red led ALARM



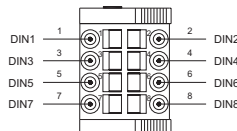
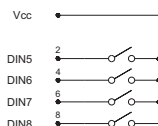
- +V24 1 2 GND
- DOUT1 3 4 DOUT2
- DOUT3 5 6 DOUT4
- DOUT5 7 8 DOUT6
- DOUT7 9 10 DOUT8
- GND 11 12 GND
- AOUT1 13 14 AOUT2
- TA1 15 16 TA2
- VP_RTD1 17 18 VP_RTD2
- AIN1 19 20 -AIN2
- +AIN1 21 22 +AIN2
- GNDR1 23 24 GNDR2
- VS 25 26 VS
- GND 27 28 GND
- VP_RTD3 29 30 VP_RTD4
- AIN3 31 32 -AIN4
- +AIN3 33 34 +AIN4
- GNDR3 35 36 GNDR4

Digital inputs 1-2-3-4



- Use 2-pole cable with max section 0.5 mm². Do not attach lug
- Amplified inputs, use 2 or 3-pole shielded cable with max section 0.5 mm². Do not attach lug. Connect shield directly to ground plate and as close as possible to the module.
- Linear analog input: use 2-pole shielded cable with max section 0.5 mm². Do not attach lug. Connect shield directly to ground plate and as close as possible to the module.
- 2-pole analog outputs $\pm 10V$ or $\pm 0/20mA$: use shielded cable with max section 0.5 mm². Do not attach lug. Connect shield directly to ground plate and as close as possible to the module
- Digital inputs / outputs: use cable max 0.1mm². Do not attach lug.

Digital inputs 5-6-7-8

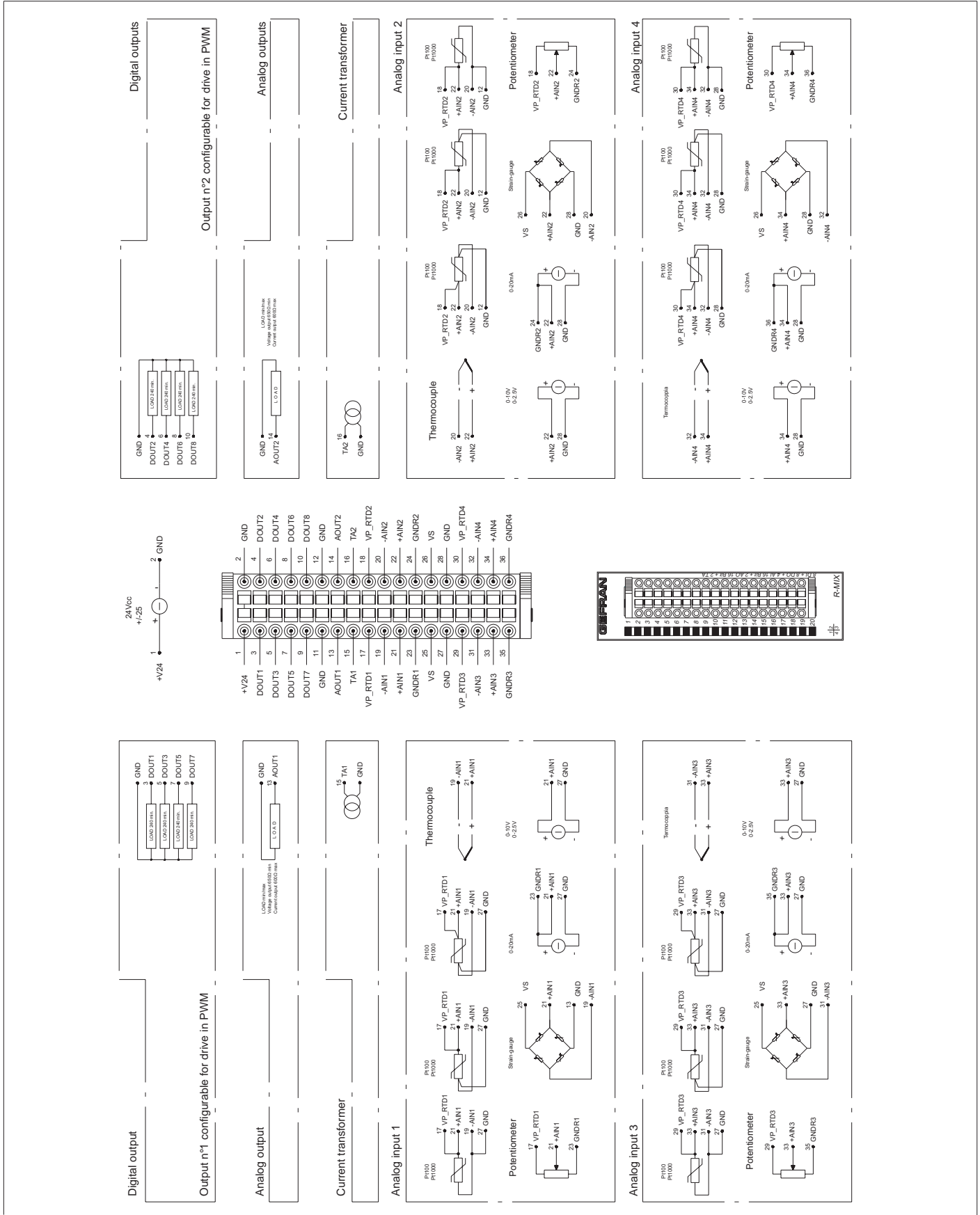


NOTE:

The shield of the analog inputs / outputs must be connected near the module and directly to the ground plate.

Configuration Counter unit 1 CU1		Configuration Counter unit 2 CU2		Configuration Counter unit 3 CU3		Physical INPUT			
Configuration	With CHz (Zero mark)	Configuration	With CHz (Zero mark)	Configuration	With CHz (Zero mark)				
UNUSED	-	UNUSED	-	UNUSED	-	DIN1	DIN2	DIN3	DIN4
		UNUSED	-	UNUSED	-	CH1_A	CH1_B	CH1_Z	DIN4
Bidirectional Encoder	YES	Monodirectional Encoder / Counter / Period / Frequency / Positive Impulse / Negative Impulse / Duty Cycle	NO	UNUSED	-	CH1_A	CH1_B	CH1_Z	CH2
		UNUSED	-	UNUSED	-	CH1_A	CH1_B	DIN3	DIN4
		Bidirectional Encoder	NO	UNUSED	-	CH1_A	CH1_B	CH2_A	CH2_B
		Monodirectional Encoder / Counter	YES	UNUSED	-	CH1_A	CH1_B	CH2	CH2_Z
Bidirectional Encoder	YES	Monodirectional Encoder / Counter / Period / Frequency / Positive Impulse / Negative Impulse / Duty Cycle	NO	UNUSED	-	CH1_A	CH1_B	CH2	DIN4
		Monodirectional Encoder / Counter / Period / Frequency / Positive Impulse / Negative Impulse / Duty Cycle	NO	Monodirectional Encoder / Counter / Period / Frequency / Positive Impulse / Negative Impulse / Duty Cycle	NO	CH1_A	CH1_B	CH2	CH3
		UNUSED	-	UNUSED	-	CH1	CH1_Z	DIN3	DIN4
Monodirectional Encoder / Counter	YES	Bidirectional Encoder	NO	UNUSED	-	CH1	CH1_Z	CH2_A	CH2_B
		Monodirectional Encoder / Counter	YES	UNUSED	-	CH1	CH1_Z	CH2	CH2_Z
		Monodirectional Encoder / Counter / Period / Frequency / Positive Impulse / Negative Impulse / Duty Cycle	NO	UNUSED	-	CH1	CH1_Z	CH2	DIN4
		Monodirectional Encoder / Counter / Period / Frequency / Positive Impulse / Negative Impulse / Duty Cycle	NO	Monodirectional Encoder / Counter / Period / Frequency / Positive Impulse / Negative Impulse / Duty Cycle	NO	CH1	CH1_Z	CH2	CH3
		UNUSED	-	UNUSED	-	CH1	DIN2	DIN3	DIN4
		Monodirectional Encoder / Counter	YES	Monodirectional Encoder / Counter / Period / Frequency / Positive Impulse / Negative Impulse / Duty Cycle	NO	CH1	CH2	CH2_Z	DIN4
Monodirectional Encoder / Counter / Period / Frequency / Positive Impulse / Negative Impulse / Duty Cycle	NO	Monodirectional Encoder / Counter / Period / Frequency / Positive Impulse / Negative Impulse / Duty Cycle	NO	UNUSED	-	CH1	CH2	DIN3	DIN4
		Monodirectional Encoder / Counter / Period / Frequency / Positive Impulse / Negative Impulse / Duty Cycle	NO	Monodirectional Encoder / Counter	YES	CH1	CH2	CH3	CH3_Z
		Monodirectional Encoder / Counter / Period / Frequency / Positive Impulse / Negative Impulse / Duty Cycle	NO	Monodirectional Encoder / Counter / Period / Frequency / Positive Impulse / Negative Impulse / Duty Cycle	NO	CH1	CH2	CH3	DIN4

FACEPLATE CONNECTIONS



CE In conformity to ECC 2004/108/CE (EMC) and 2006/95/CE (LVD) with reference to: **EN 61131-2** (product) **EN 61010-1** (safety).



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