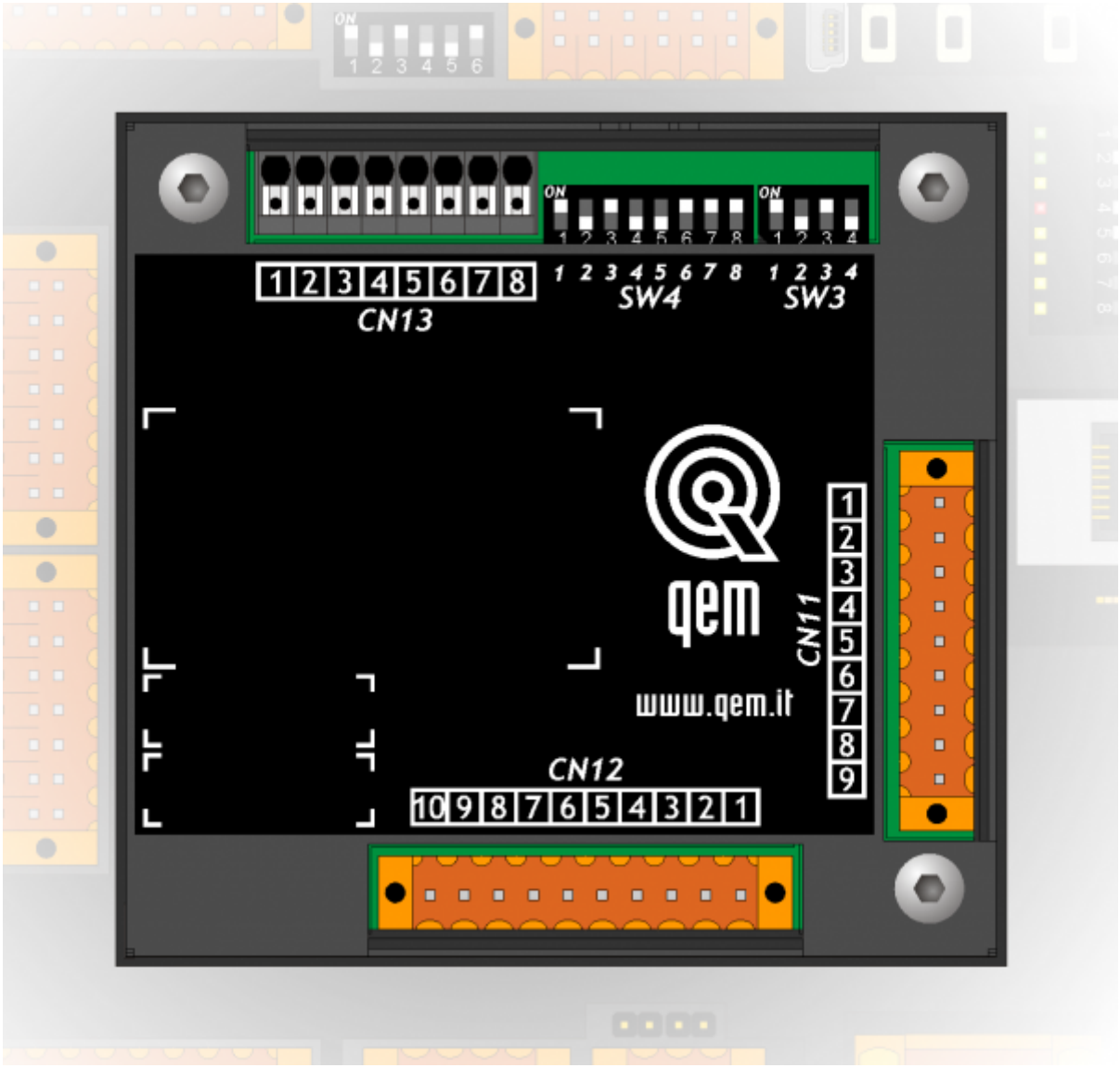
Sommario

Specialization card 1AD2F rel.03



Informations

Quality in Electronic Manufacturing

Document:	**MIM1AD2F02**
Description:	Installation and maintenance manual
Editor:	Riccardo Furlato
Approver	Gabriele Bazzi
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Language:	English

Document release	Hardware release	Description	Note	Date
01	02	New manual		17/12/2014
02	02	Improved description of the analog input connector table and fixed the hardware release of the card		18/06/2015
03	02	Fixed the SW3 setting description and examplex	01/02/2016	

1. Description

The **1AD2F** card of Qmove+ series.

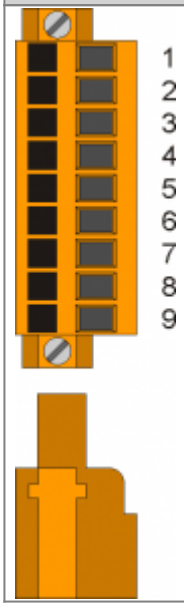
1.1 Equipment

	8 digital inputs
	2 multistandard analog inputs 16bit
	8 digital outputs

2. Connections

2.1 Digital inputs

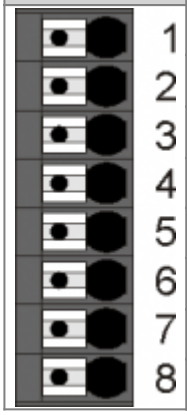
2.1.1 8 digital inputs

CN11	Terminal	Simbol	Description	Address
	9	0V	Digital inputs common	
	8	I17	Input I17	3.INP01
	7	I18	Input I18	3.INP02
	6	I19	Input I19	3.INP03
	5	I20	Input I20	3.INP04
	4	I21	Input I21	3.INP05
	3	I22	Input I22	3.INP06
	2	I23	Input I23	3.INP07
	1	I24	Input I24	3.INP08

2.2 Analog inputs

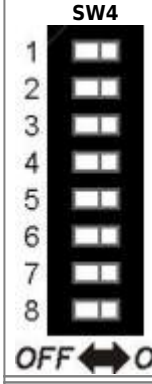
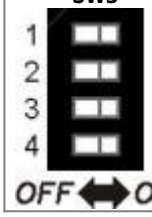
2.2.1 2 multistandard analog inputs

Connector

CN13	Terminal	Simbol	Description			Address
			Potentiometric / 0-10V / 0-20mA	Termocouple	PT100	
	1	GAI	Analog inputs common	-	-	
	2	VREF	Reference volatege [1]	-	-	
	3	AI1_A	Analog input 1	-	A [2]	
	4	AI1_B	-	TC 1 -	B	3.AI01
	5	AI1_C	-	TC 1 +	C	
	6	AI2_A	Analog input 2	-	A [3]	
	7	AI2_B	-	TC 2 -	B	3.AI02
	8	AI2_C	-	TC 2 +	C	

[1] For potentiometric inputs
[2], [3] A and B cables connected to the resistance, have the same color.
In the case of 2-wire PT100 you must make a jumper between A and B.

Analog inputs setting

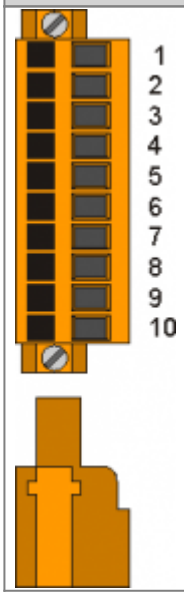
	Num. Dip	Analog input 1					Analog input 2				
		PT100	Termocouple	Pot.	0-10V	0-20mA	PT100	Termocouple	Pot.	0-10V	0-20mA
SW4 	1	ON	X	OFF	OFF	OFF	X	X	X	X	X
	2	OFF	X	ON	ON	ON	X[1]	X	X	X	X
	3	X	X	X	X	X	ON	X	OFF	OFF	OFF
	4	X[2]	X	X	X	X	OFF	X	ON	ON	ON
	5	ON	ON	OFF	OFF	OFF	X	X	X	X	X
	6	OFF	OFF	ON	ON	ON	X	X	X	X	X
	7	OFF	ON	X	X	X	X	X	X	X	X
	8	X	X	X	X	X	OFF	ON	X	X	X
SW3 	1	X	X	X	X	X	X	X	OFF	OFF	ON
	2	X	X	X	X	X	X	X	OFF	ON	OFF
	3	X	X	OFF	OFF	ON	X	X	X	X	X
	4	X	X	OFF	ON	OFF	X	X	X	X	X

X = setting not significant
Pot. = potentiometric type input

[1] To set OFF if not use for analog input 1
[2] To set OFF if not use for analog input 2

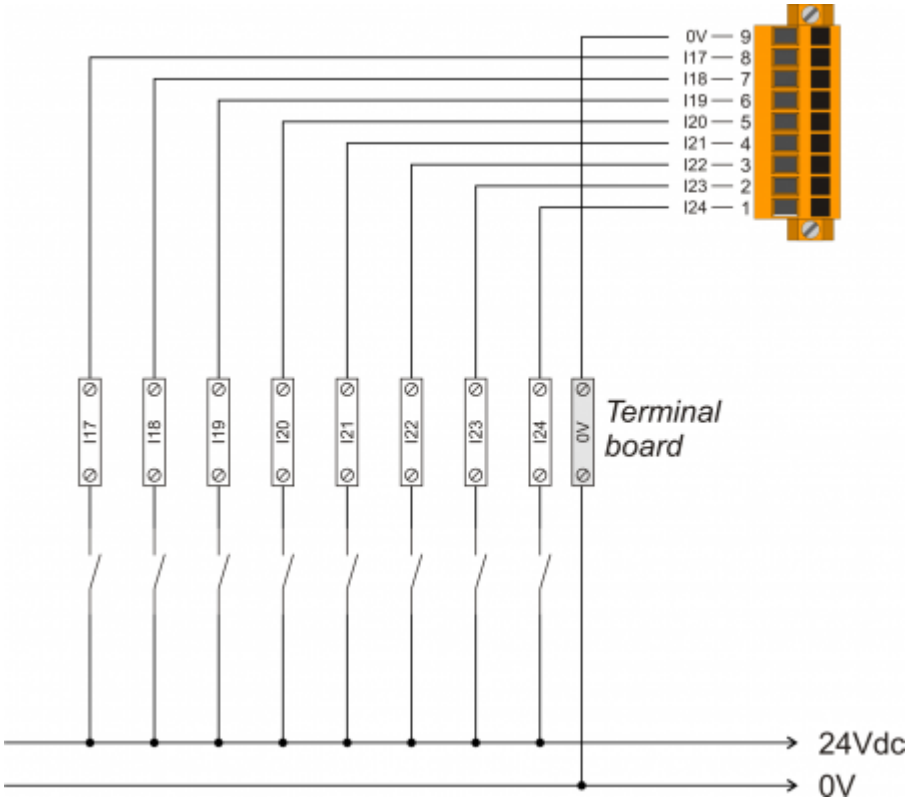
2.3 Digital outputs

2.3.1 8 protected digital outputs

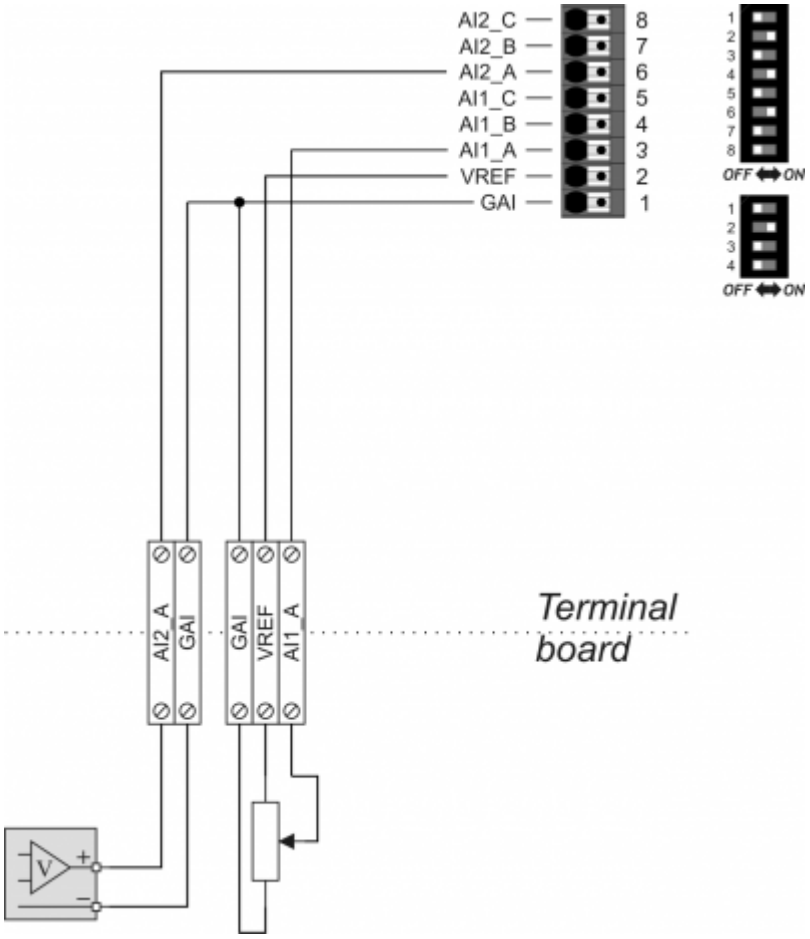
C12	Terminal	Simbol	Description	Address
	1	V+	Output power input (12÷28V dc)	
	2	O17	Digital output 17	3.OUT01
	3	O18	Digital output 18	3.OUT02
	4	O19	Digital output 19	3.OUT03
	5	O20	Digital output 20	3.OUT04
	6	O21	Digital output 21	3.OUT05
	7	O22	Digital output 22	3.OUT06
	8	O23	Digital output 23	3.OUT07
	9	O24	Digital output 24	3.OUT08
	10	V-	Output power input (0V dc)	

3. Connection examples

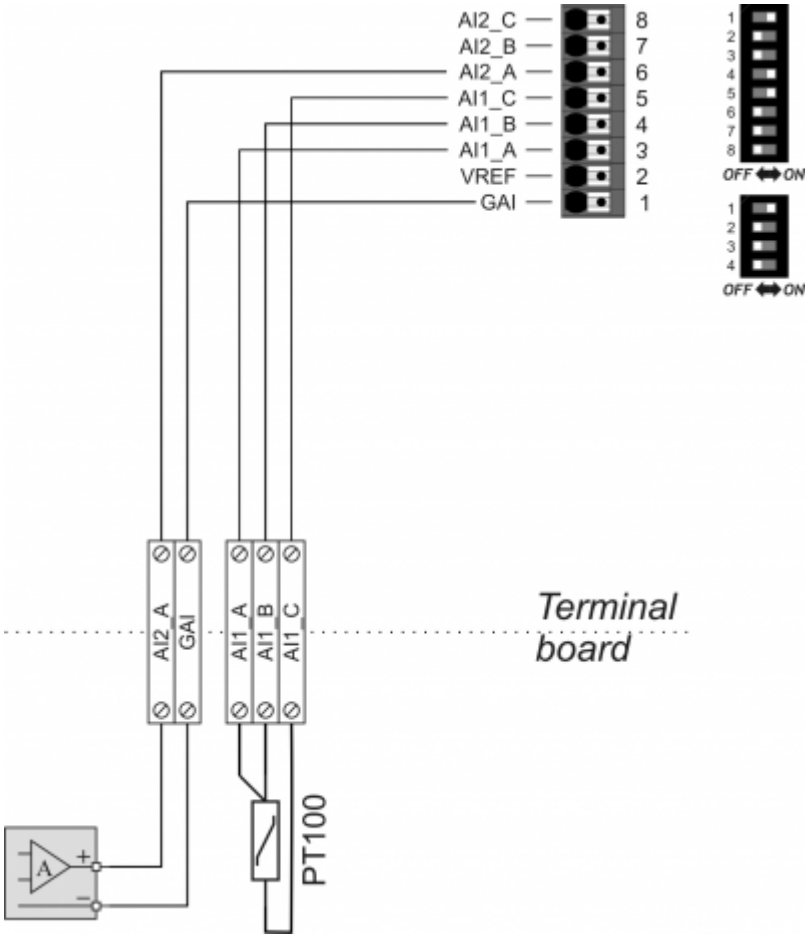
3.1 Digital inputs



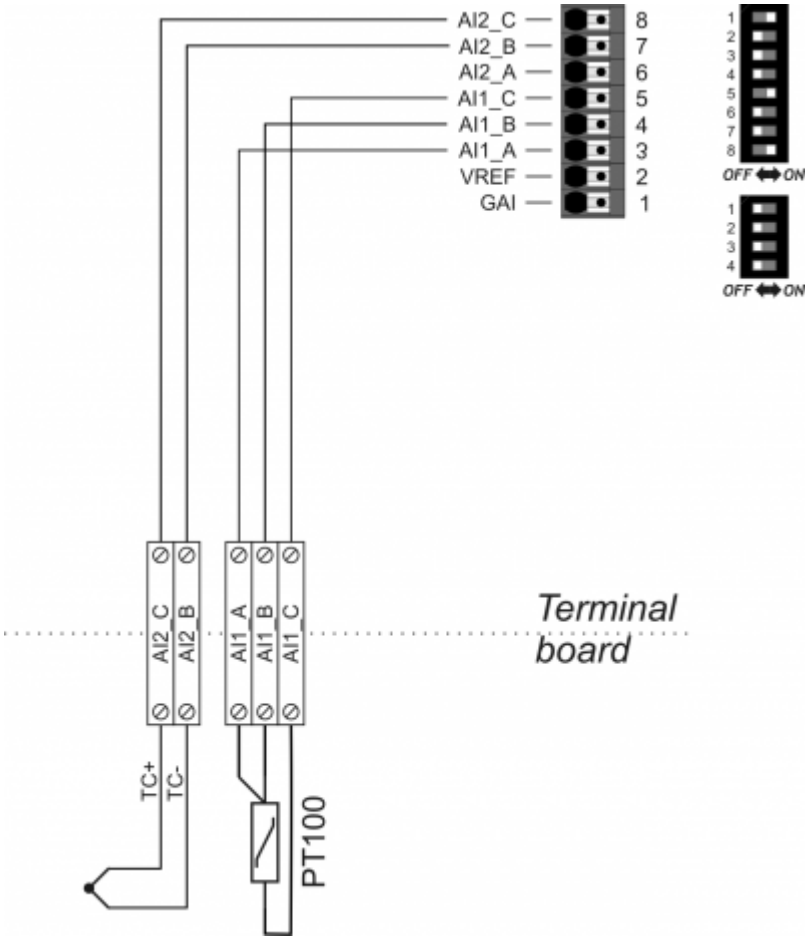
3.2 Potentiometric analog input 1 and voltmetric analog input 2



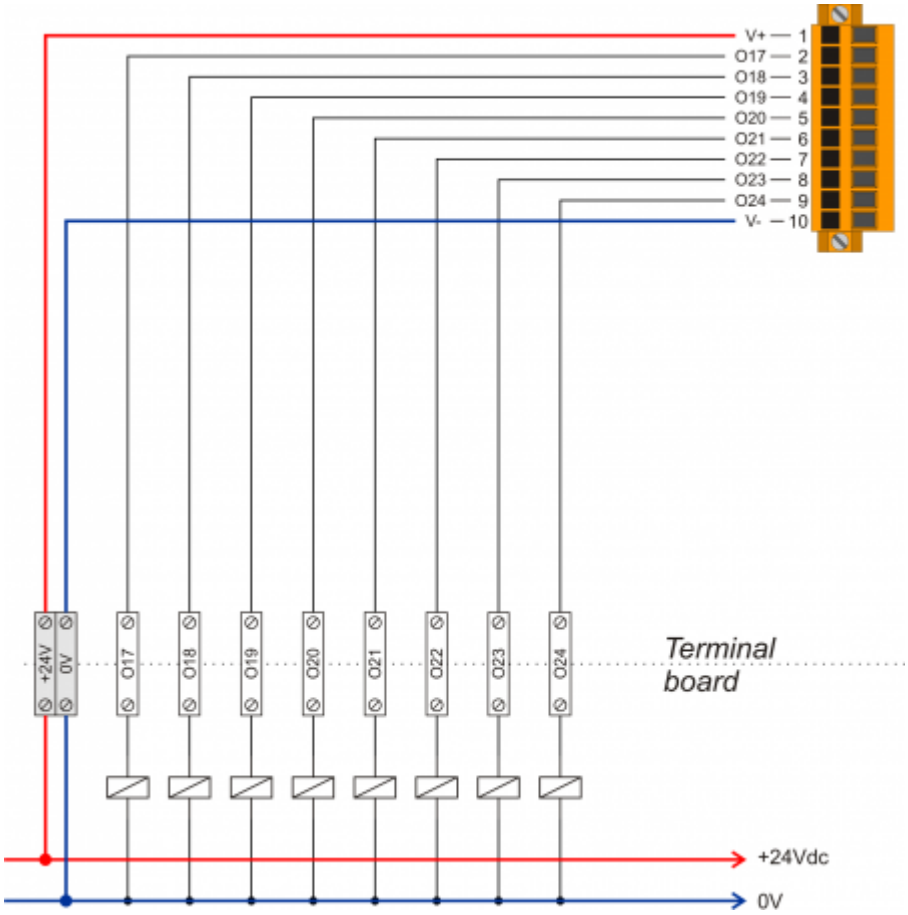
3.3 PT100 analog input 1 per and amperometric inputs 2



3.4 PT100 analog input 1 and termocouple analog input 2



3.5 Protected digital outputs



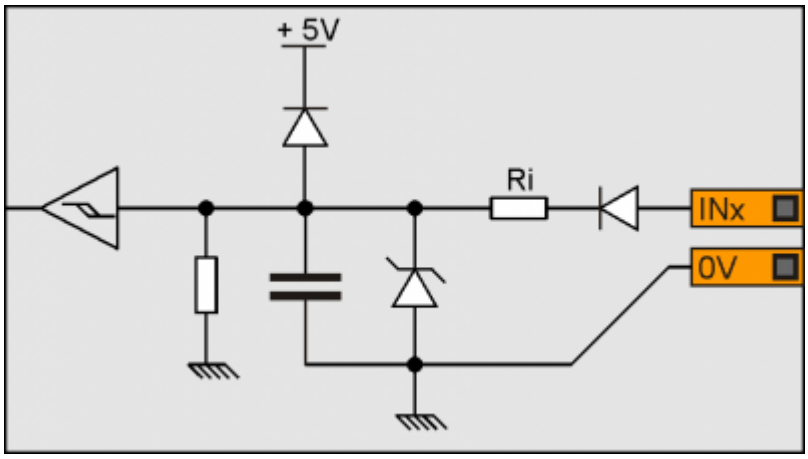
4. Electrical features

The following are the electrical hardware features.
The maximum and minimum frequency values and actual acquisition times, can still depend on any additional software filters, see the system variable “QMOVE:sys004”.

4.1 Digital inputs

Type of polarisation	PNP
Min. acquisition time (hardware)	3ms
Isolation	1000Vrms
Rated operating voltage	24Vdc
Voltage of logic state 0	0-2 V
Voltage of logic state 1	10.5 - 26.5 V
Internal voltage drop	5V
Input resistance (Ri)	2700Ω
Sink current	2mA ÷ 8mA[1)]

[1)] **CAUTION: If the device connected to the inputs needs a higher minimum current, inputs may not work properly.**



4.2 Analog inputs

4.2.1 Conversion times

The electrical features depend on the type of input, configurable via DIP switch.

The conversion times from analog to digital depend on the configuration according to the table:

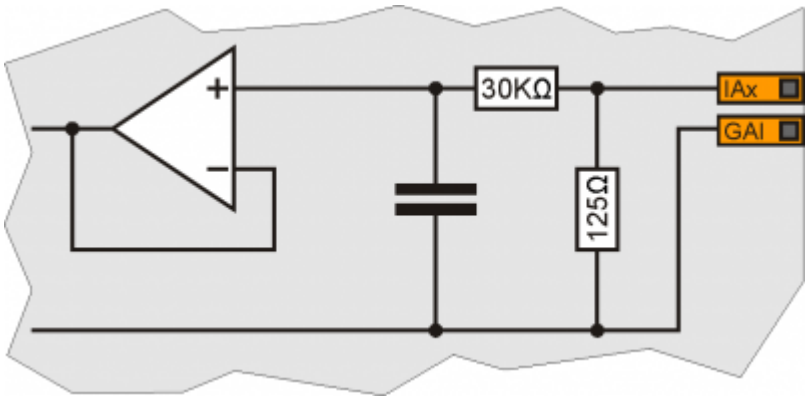
Analog Input Configuration		Conversion time per channel
Input 1	**Input 2**	
DC[1)]	-	4.6 ms
-	DC[2)]	4.6 ms
DC[3)]	DC[4)]	9.3 ms
DC[5)]	TC	9.3 ms
DC[6)]	PT100	79.1 ms
TC	-	9.3 ms
-	TC	9.3 ms
TC	DC[7)]	9.3 ms
TC	TC	9.3 ms
TC	PT100	83.8 ms
PT100	-	74.5 ms
-	PT100	74.5 ms
PT100	DC[8)]	79.1 ms
PT100	TC	79.1 ms
PT100	PT100	79.1 ms

[1), 2), 3), 4), 5), 6), 7), 8)] Amperometric, voltmetric or potentiometric type

4.2.2 Amperometric analog inputs in 0-20mA configuration

Connection type	Amperometric (0-20 mA)
Resolution	12bit/16bit[1)]
Input resistance	125Ω
Value of damage	25 mA
Max. Linearity error	± 0,1% Vfs
Max. Offset error	± 0,1% Vfs
S.n.	71 dB
Conversion time	It depends on the configuration of the analog input. See section Conversion times if present [2)]
Isolation	1000 Vrms

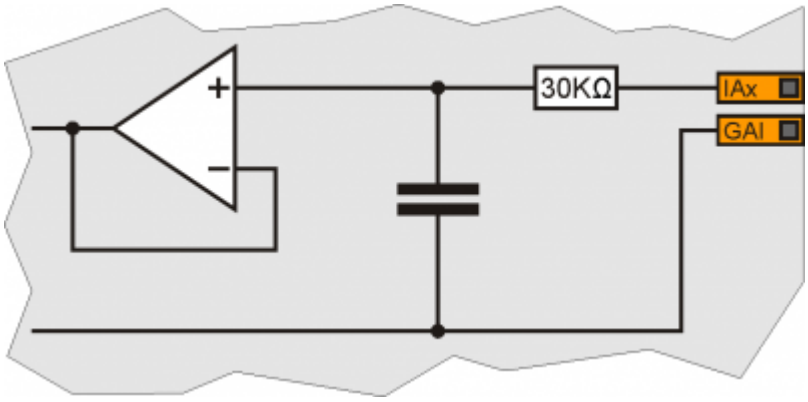
[1)] It depends on the Hardware versions
[2)] The sampling time of the device must be equal or higher than the conversion time



4.2.3 Potentiometric analog input configuration

Connection type	Potentiometric 1KΩ÷20KΩ
Resolution	12bit/16bit[1)]
Reference voltage output	2,5Vdc
Max output current from reference	10mA
Input resistance	10MΩ
Max. Linearity error	± 0,1% Vfs
Max. Offset error	± 0,1% Vfs
S.n.	71 dB
Conversion time	It depends on the configuration of the analog input. See section Conversion times if present [2)]
Isolation	1000 Vrms

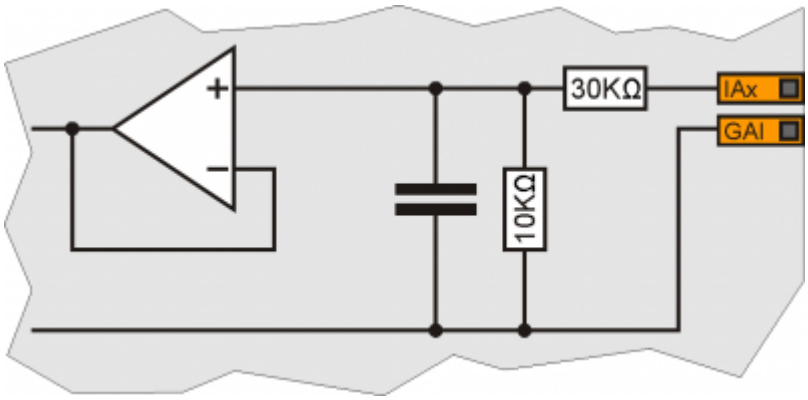
[1)] It depend on the Hardware versions
[2)] The sampling time of the device must be equal or higher than the conversion time



4.2.4 Voltmetric analog input configuration

Connection type	Voltmetrico 0÷10V
Resolution	12bit/16bit[1)]
Input resistance (Rin)	40KΩ
Value of damage	20V
Max. Linearity error	± 0,1% Vfs
Max. Offset error	± 0,1% Vfs
S.n.	71 dB
Conversion time	It depends on the configuration of the analog input. See section Conversion times if present [2)]
Isolation	1000 Vrms

[1)] It depends on the Hardware versions
[2)] The sampling time of the device must be equal or higher than the conversion time



4.2.5 PT100 analog input configuration

Sensor type collegabile	PT100 3 wire [1]
Measure type	Resistance [2]
Resolution	15 bit (32767 corresponds to 250.00 O)
Input resistance (Rin)	15 MO
Measuring current	1 mA
Value of damage	10V
Accuracy of resistance measurement	± 0,04%
Conversion time	It depends on the configuration of the analog input. See section Conversion times if present [3]
Isolation	1000 Vrms

[1] Also connected to 2-wire terminals with jumper
[2] Temperature calculated by software
[3] The sampling time of the device must be equal or higher than the conversion time

4.2.6 Termocouple analog input configuration

Sensor type	Thermocouple type J,K,R,S,B,N,T,E [1)]
Type of measure	Differential voltage
Resolution	16 bit
Measuring range	±156.25 mV
Measure for cold junction compensation	Integrated
Input resistance (Rin)	15 MO
Value of damage	30V
Measurement accuracy	± 0,2% (excluding cold junction compensation)
Conversion time	It depends on the configuration of the analog input. See section Conversion times if present [2)]
Isolation	1000 Vrms

[1)] J and K only supported by SW. Contact QEM for the support of the other sensor types.
[2)] The sampling time of the device must be equal or higher than the conversion time

4.2.7 Protected digital outputs

Switchable load	Dc (PNP)
Max. operating voltage	28V
Insulation	1000VRMS
Max. internal voltage drop	600mV
Max internal resistance @ON	90mO
Max. protection current	12A
Max. operating current	500mA
Max. current @OFF	5µA
Max switching time from ON to OFF	270µs
Max switching time from OFF to ON	250µs