



GX8A10

HARDWARE MANUAL

MANUAL: GX8A10 HW EN v.1.00

PRELIMINARY

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INDEX

1 Introduction.....	5
1.1 GX8A10 - Description.....	5
2 EC conformity declaration.....	6
3 Specifications.....	7
3.1 Electrical specifications.....	7
3.1.1 Analog Inputs.....	7
4 Connectors and wiring.....	9
4.1 Analog inputs – X11, X12, X14 and X15.....	10
4.1.1 Analog Inputs X11, X12, X14 and X15 connector description and pinout.....	10
4.1.2 Analog inputs electrical connection.....	12
4.2 PT1000 and Analog input - X13.....	13
4.2.1 PT1000/Analog In X13 connector description and pinout.....	13
4.2.2 Analog input electrical connection.....	14
4.2.3 PT1000 input electrical connection.....	15
4.3 Isolated 24V power for 4...20 mA inputs - X16.....	16
4.3.1 Current sensors power connector description and pinout.....	16
5 GX8A10 STM32 pin reference.....	17

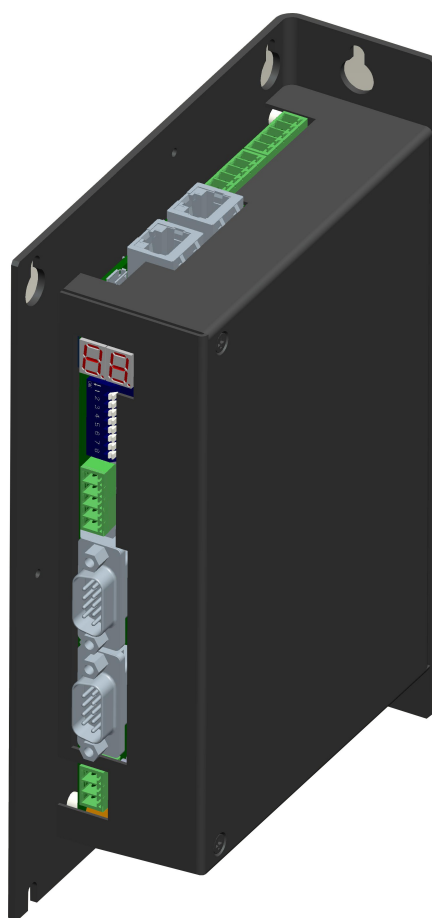
Note:

1 Introduction

This manual explains all the features added to GWA202 controller when the optional expansion board GX8A10 is mounted on top of GWA202.

**Information**

This manual is an addendum of the GWA202 User's Manual and must be used together with it.



1.1 GX8A10 - Description

GX8A10 Expansion board adds the following features to the GWA202 Controller:

- 8 Analog Inputs
- 1 PT1000/Analog Input

2 EC conformity declaration

DRAFT

TECNOLOGIX S.R.L. hereby declares that the product:

Model:	GWA
with article numbers:	GWA202-M4-E1-X1 GWA202-M4-E2-X1 GWA202-H7-E1-X1 GWA202-H7-E2-X1
fulfils the requirements of the standards:	
EN 61000-6-4:2007 +A1:2011	EN 55022:2010+AC:2011
Emission standard for-industrial environments	
EN 61000-6-2:2005	EN 55024:2010
Immunity for industrial environments	
according to the following test report:	Politecnico di Torino Sede di Alessandria - LIE TR 20-02 LIE 04/02/2020
The product thus complies with the EC directive:	2014/30/UE

This declaration applies to all devices that bear the CE symbol and loses its validity if modifications are carried out on the product.

Milano, 04 February 2020
Bruno Coppi
Technical Director



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3 Specifications

3.1 Electrical specifications

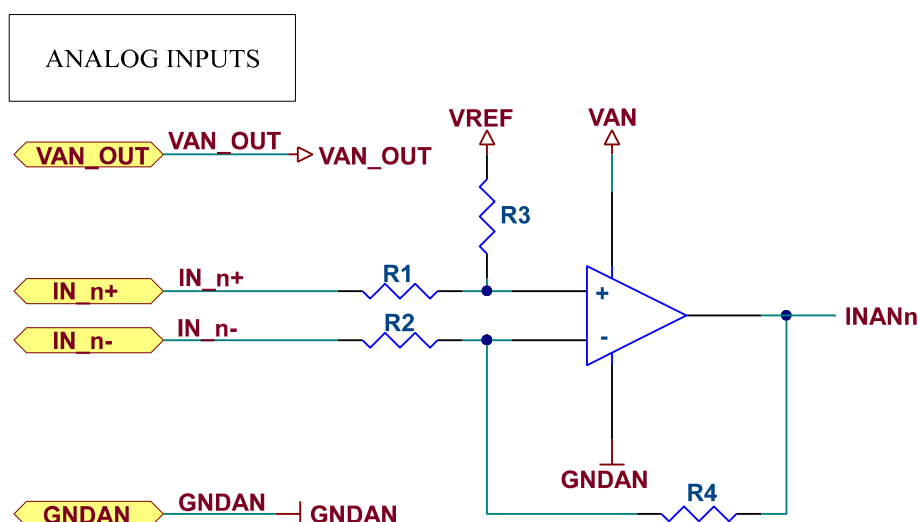
3.1.1 Analog Inputs

Analog inputs

Non-insulated Voltage Analog Inputs may be factory configured to operate in several modalities.

- $0 \div 10\text{V}$ range; $\pm 10\text{V}$ range;
- $4 \dots 20 \text{ mA}$ range;
- direct potentiometer connection.

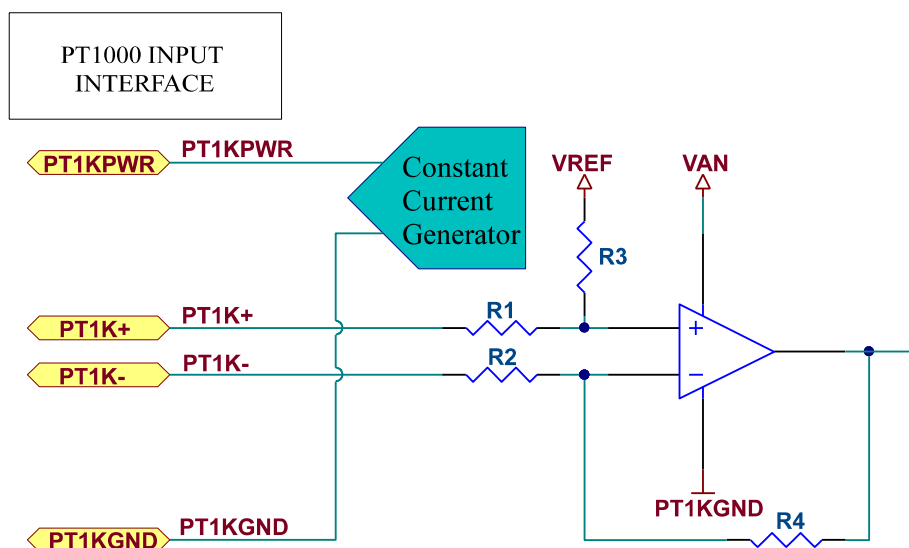
Analog inputs connection schematic



To avoid damages to input circuitry, please do not exceed minimum and maximum ratings reported in the following table:

Analog Inputs electrical specifications	
Full scale Analog Range	$0 \div 10 \text{ Vdc} \pm 5\%$
	$\pm 10 \text{ Vdc} \pm 5\%$
Input Resistance	$> 40 \text{ K}\Omega$
Resolution of Analog Conversion	12bit
Precision	
Non-Linearity (% full scale)	0.03% @25°C

PT1000 interface connection schematic



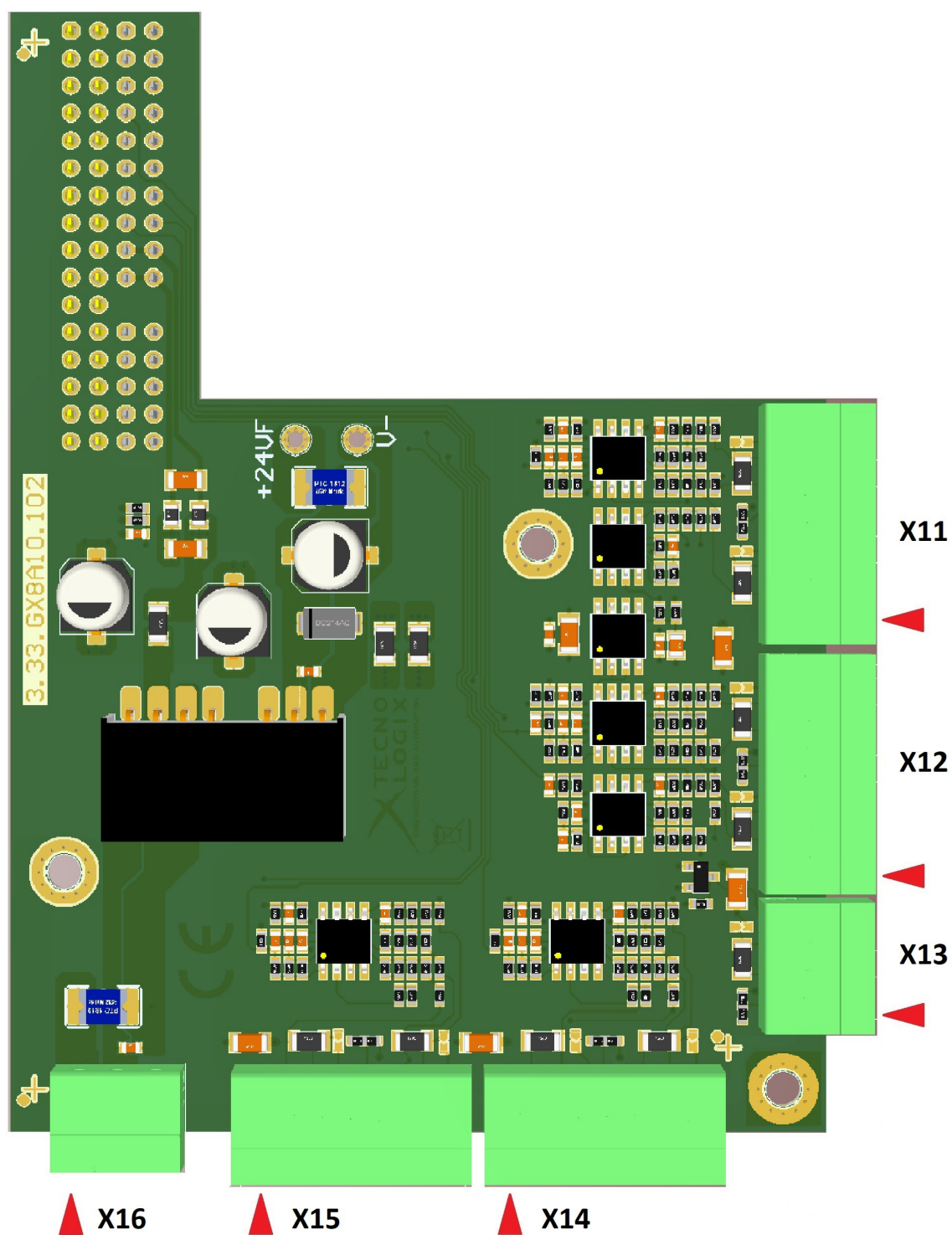
To avoid damages to input circuitry, please do not exceed minimum and maximum ratings reported in the following table:

PT1000 Interface	
RTD	PT1000
Input Resistance	>220Kohm
Resolution of Analog Conversion	12bit
Precision	±0.5%
Non-Linearity (% full scale)	0.03% @25°C
RTD power supply	self-powered



Full scale Analog Range depend on specific device version.

4 Connectors and wiring



4.1 Analog inputs – X11, X12, X14 and X15

Introduction GX8A board is equipped with eight Analog Input interfaces, connected to STM32 12 bit A/D Converters. Input signals are differential and can be factory configured as $\pm 10V$ or 0-10V. Analog Inputs are located on X11, X12, X14 and X15 connectors and are NOT INSULATED from microcontroller ground.



Please refer to software manual for information about Analog Input operations.

Cabling requirements Please use shielded twisted pairs with 1.0 mm² (#18AWG) or 0.5 mm² (#20AWG) section.



Connector X16 is available to provide the isolated 24V power supply for transducers.

4.1.1 Analog Inputs X11, X12, X14 and X15 connector description and pinout

X11, X12, X14 and X15 are Phoenix 8-pole male connector MC 0,5/ 8-G-2,5 – 1881503

Mating female is Phoenix FK-MC 0,5/ 8-ST-2,5 - 1881383

Connections X11 – Analog Inputs

Signal	Pin	Description
VAN_OUT	X11.1	+V Analog Power Output
IN_0+	X11.2	Input 0+
IN_0-	X11.3	Input 0-
GNDAN	X11.4	Analog Ground
VAN_OUT	X11.5	+V Analog Power Output
IN_1+	X11.6	Input 1+
IN_1-	X11.7	Input 1-
GNDAN	X11.8	Analog Ground

Connections X12 – Analog Inputs

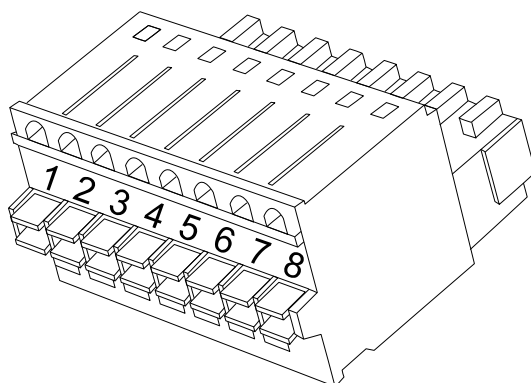
Signal	Pin	Description
VAN_OUT	X12.1	+V Analog Power Output
IN_2+	X12.2	Input 2+
IN_2-	X12.3	Input 2-
GNDAN	X12.4	Analog Ground
VAN_OUT	X12.5	+V Analog Power Output
IN_3+	X12.6	Input 3+
IN_3-	X12.7	Input 3-
GNDAN	X12.8	Analog Ground

Connections X14 – Analog Inputs

Signal	Pin	Description
VAN_OUT	X12.1	+V Analog Power Output
IN_4+	X12.2	Input 4+
IN_4-	X12.3	Input 4-
GNDAN	X12.4	Analog Ground
VAN_OUT	X12.5	+V Analog Power Output
IN_5+	X12.6	Input 5+
IN_5-	X12.7	Input 5-
GNDAN	X12.8	Analog Ground

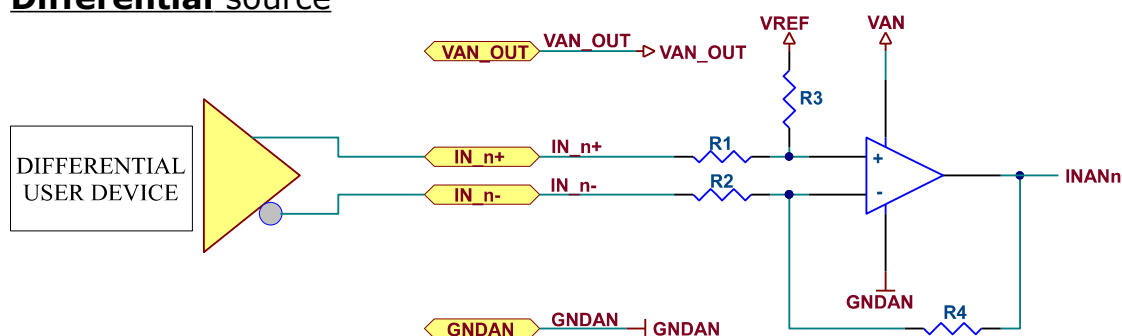
Connections X15 – Analog Inputs

Signal	Pin	Description
VAN_OUT	X12.1	+V Analog Power Output
IN_6+	X12.2	Input 6+
IN_6-	X12.3	Input 6-
GNDAN	X12.4	Analog Ground
VAN_OUT	X12.5	+V Analog Power Output
IN_7+	X12.6	Input 7+
IN_7-	X12.7	Input 7-
GNDAN	X12.8	Analog Ground

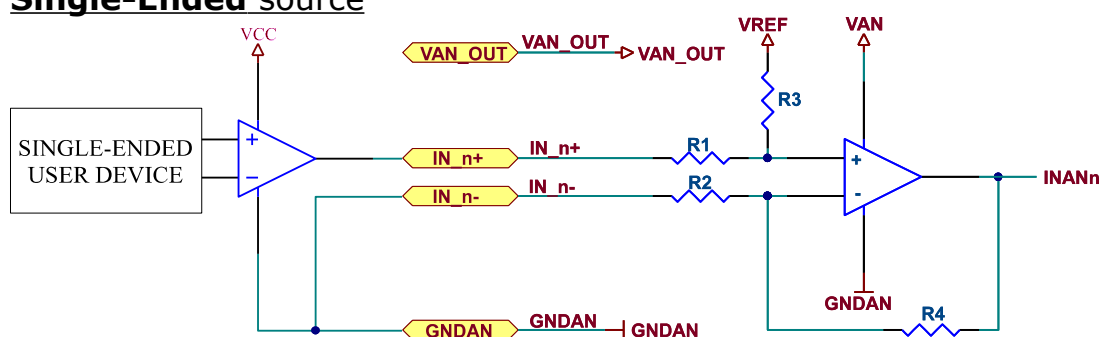
Pin assignment

4.1.2 Analog inputs electrical connection

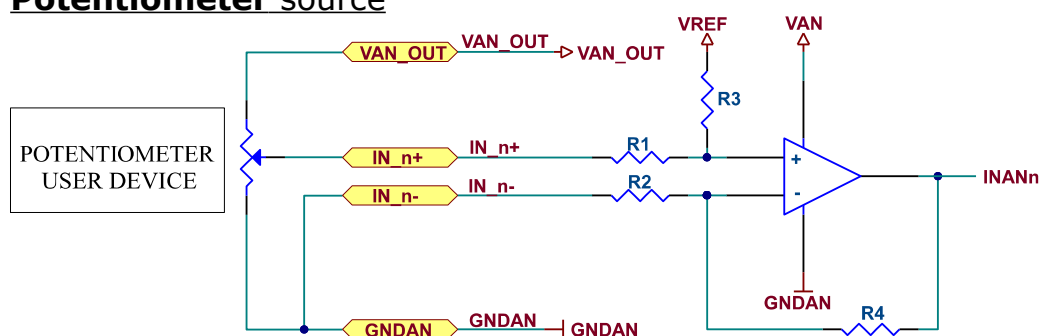
Differential source



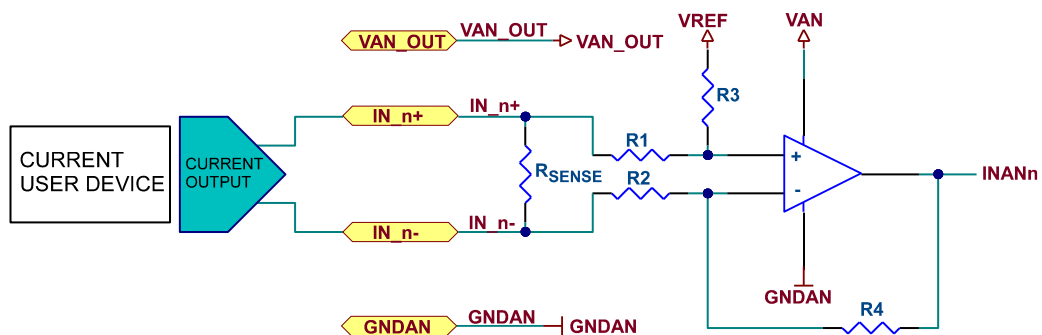
Single-Ended source



Potentiometer source



Current source



4.2 PT1000 and Analog input - X13

Introduction GWX board is equipped with one PT1000/Analog Input interface, connected to STM32 12 bit A/D Converter.
This Input can be factory configured as signal conditioner for a PT1000 Temperature Sensor or as an Analog Input $\pm 10V$ or 0-10V. The Input is located on X13 connector and is NOT INSULATED from microcontroller ground.



Please refer to software manual for information about PT1000 Input/Analog Input operations.

Cabling requirements Please use shielded twisted pairs with 1.0 mm² (#18AWG) or 0.5 mm² (#20AWG) section.

4.2.1 PT1000/Analog In X13 connector description and pinout

X13 is a Phoenix 4-pole male connector MC 0,5/ 4-G-2,5 – 1881464
Mating female is Phoenix FK-MC 0,5/ 4-ST-2,5 - 1881341

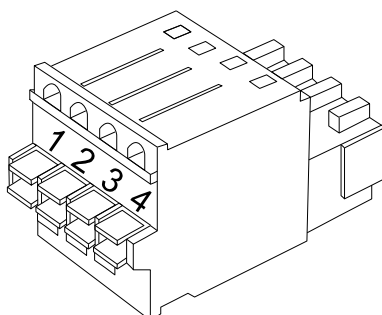
Connections X13 – Factory Configured as PT1000 Input

Signal	Pin	Description
PT1KPWR	X13.1	PT1000 Power Output
PT1K+	X13.2	PT1000 Input+
PT1K-	X13.3	PT1000 Input-
PT1KGND	X13.4	PT1000 Ground

Connections X13 – Factory Configured as Analog Input

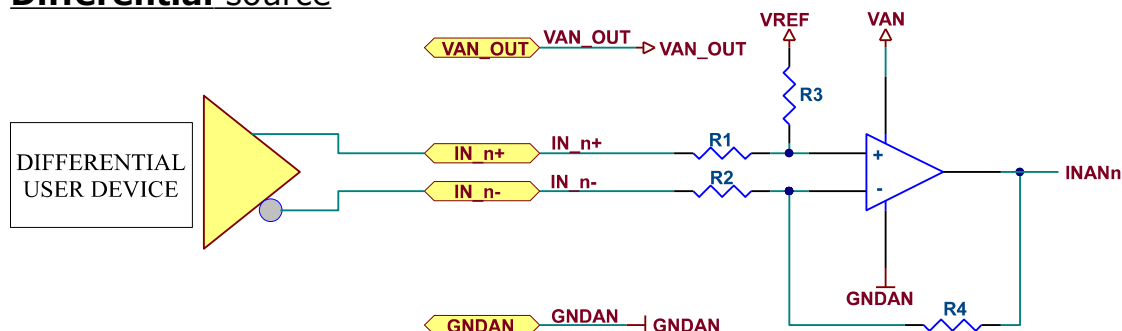
Signal	Pin	Description
VAN_OUT	X13.1	+V Analog Power Output
IN_8+	X13.2	Input 8+
IN_8-	X13.3	Input 8-
GNDAN	X13.4	Analog Ground

Pin assignment

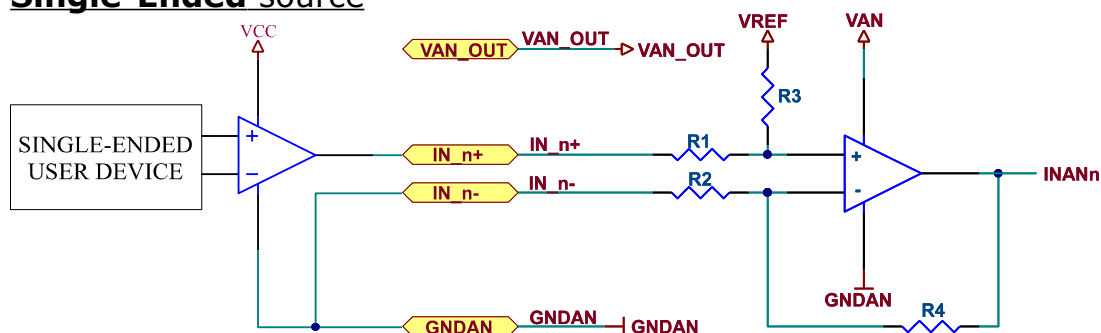


4.2.2 Analog input electrical connection

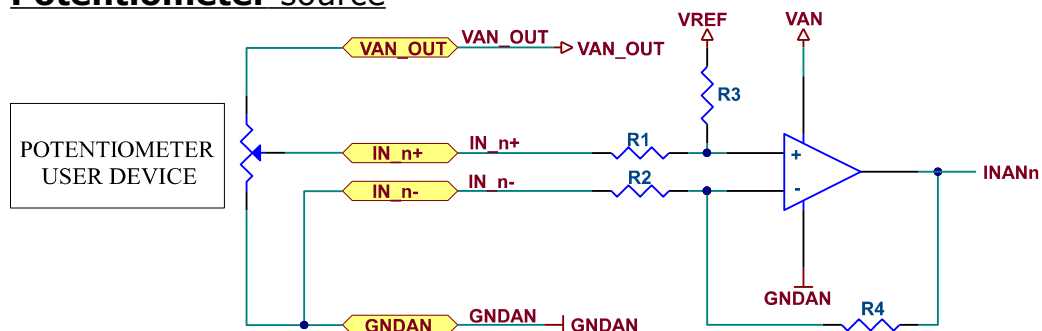
Differential source



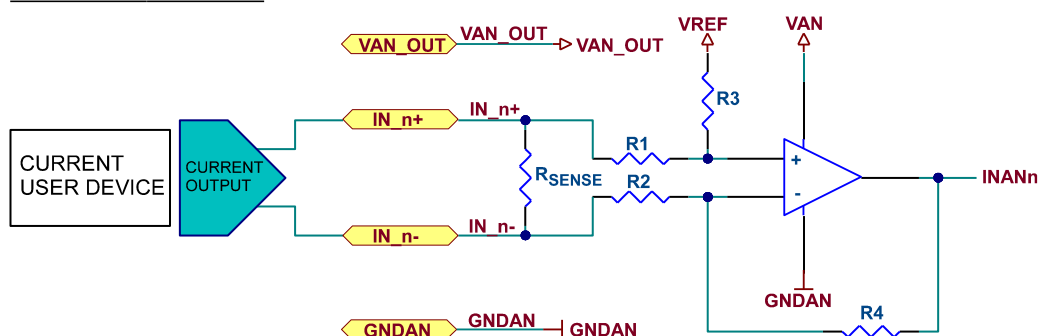
Single-Ended source



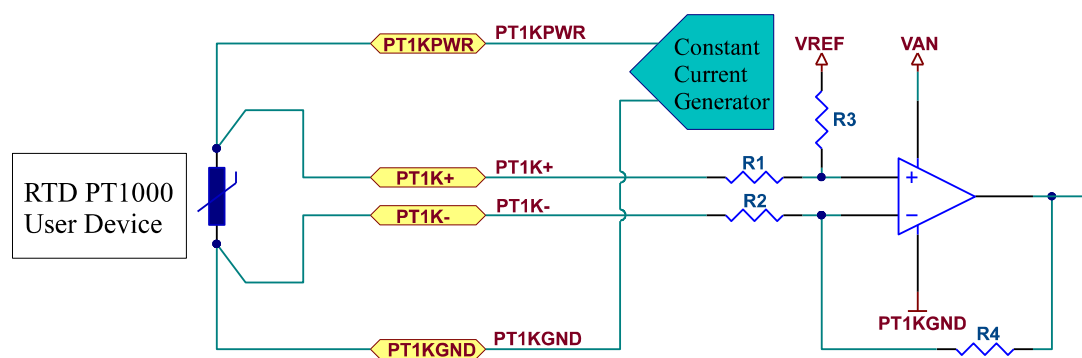
Potentiometer source



Current source



4.2.3 PT1000 input electrical connection



4.3 Isolated 24V power for 4...20 mA inputs - X16

Introduction X16 connector provides 24V isolated power for the 4...20 mA sensors.

NOTE: This connector is optionally available only when one or more inputs have been factory configured in 4...20 mA input mode

Cabling requirements Please use shielded cable wires with 1.0 mm² (#18AWG) or 0.5 mm² (#20AWG) section.

4.3.1 Current sensors power connector description and pinout

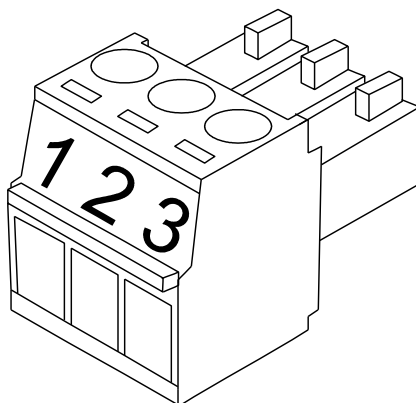
X16 is a Phoenix 3-pole male connector MC 1,5/3-G-3,5 - 1844223

Mating female is Phoenix MC 1,5/3-ST-3,5 - 1840379

Connections X16 – Outputs

Signal	Pin	Description
S+24V	X16.1	Sensor power supply (+24V)
S_GND	X16.2	Sensor power supply ground (-)
EARTH	X16.3	Earth Ground

Pin assignment



5 GX8A10 STM32 pin reference

GX8A v.1.00			
Subsystem	Signal Name	Port	Type
ANALOG IN			
	IN_0	PA0 (ADC123_IN0)	ANALOG IN
	IN_1	PA3 (ADC123_IN3)	ANALOG IN
	IN_2	PB0 (ADC12_IN8)	ANALOG IN
	IN_3	PC0 (ADC123_IN10)	ANALOG IN
	IN_4	PA4 (ADC12_IN4)	ANALOG IN
	IN_5	PF6 (ADC3_IN4)	ANALOG IN
	IN_6	PF7 (ADCV3_IN5)	ANALOG IN
	IN_7	PF8 (ADC3_IN6)	ANALOG IN
	PT1K IN_8	PB1 (ADC12_IN9)	ANALOG IN
	PT_EN	PG7	OUT PP
OTHER			
	XVERSION	PF9 (SEE VERS. TABLE)	ANALOG IN
Types Legend			
IN	Input		
ANALOG IN	Analog Input		
I/O PP	I/O Push Pull		
I/O OD	I/O Open Drain		
OUT PP	Output Push Pull		
SF	Special Function		