GXIO10

HARDWARE MANUAL

MANUAL: GXIO10 HW EN

PRELIMINARY

DISCLAIMER

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1.00	BC	First release	06/02/20
1.01	BC	Minor adjustments	25/02/20
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1.03	BC	Renamed to GXIO for product line uniformity Updated board image	17/09/20

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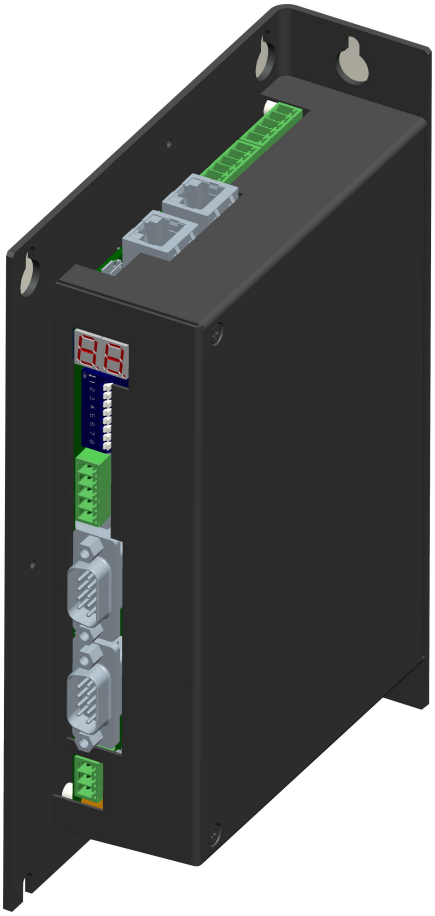
Note:

1 Introduction

This manual explains all the features added to GWA202 controller when the optional expansion board GXIO100 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 GXIO100 - Description

GXIO100 Expansion board adds the following features to the GWA202 Controller:

- 16 Inputs + 16 Outputs

2 EC conformity declaration

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

Model:	GWA
with article numbers:	GWA202-M4-E1-X1 GWA202-M4-E2-X1 GWA202-M7-E1-X1 GWA202-M7-E2-X1

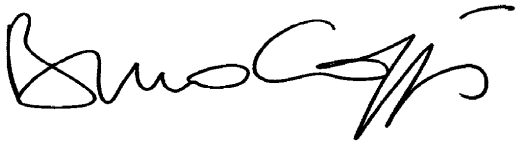
fulfils the requirements of the standards:

EN 61000-6-4:2007 +A1:2011 • Emission standard for-industrial environments	EN 55022:2010+AC:2011
EN 61000-6-2:2005 • Immunity for industrial environments	EN 55024:2010

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

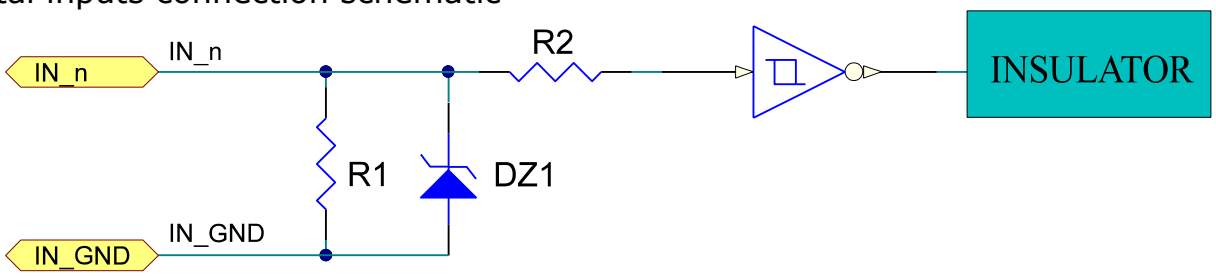
Electrical tolerance specifications satisfy EN 60204 standards, if not stated elsewhere.
Some product features depend upon product version.

3.1.1 Digital I/O

Digital inputs

Opto-insulated, 500 Hz bandwidth, 24Vdc PNP/Push-Pull (5Vdc upon request).

Digital inputs connection schematic



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

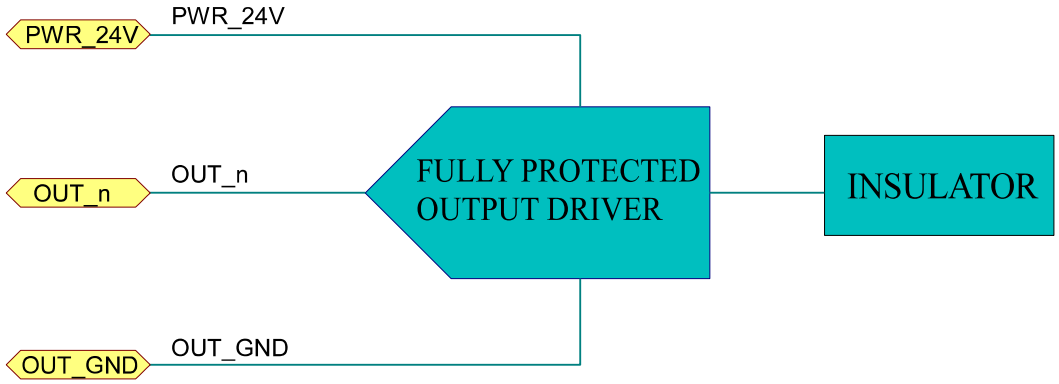
Digital inputs electrical specifications					
Nominal voltage	**Limits**	**Logical state 0**		**Logical state 1**	
		UL V	**IL mA**	**UH V**	**IH mA**
5 Vdc ± 5%	**Max.**	1.5	ND	5	17
	Min.	0	ND	2	3
24 Vdc ± 20%	**Max.**	ND	ND	19.2	7
	Min.	ND	ND	28.8	12
f_{MAX}		500 Hz			
Protections		Protected against polarity inversion			

The external device connected to GWA should have a dedicated power supply.

Digital outputs

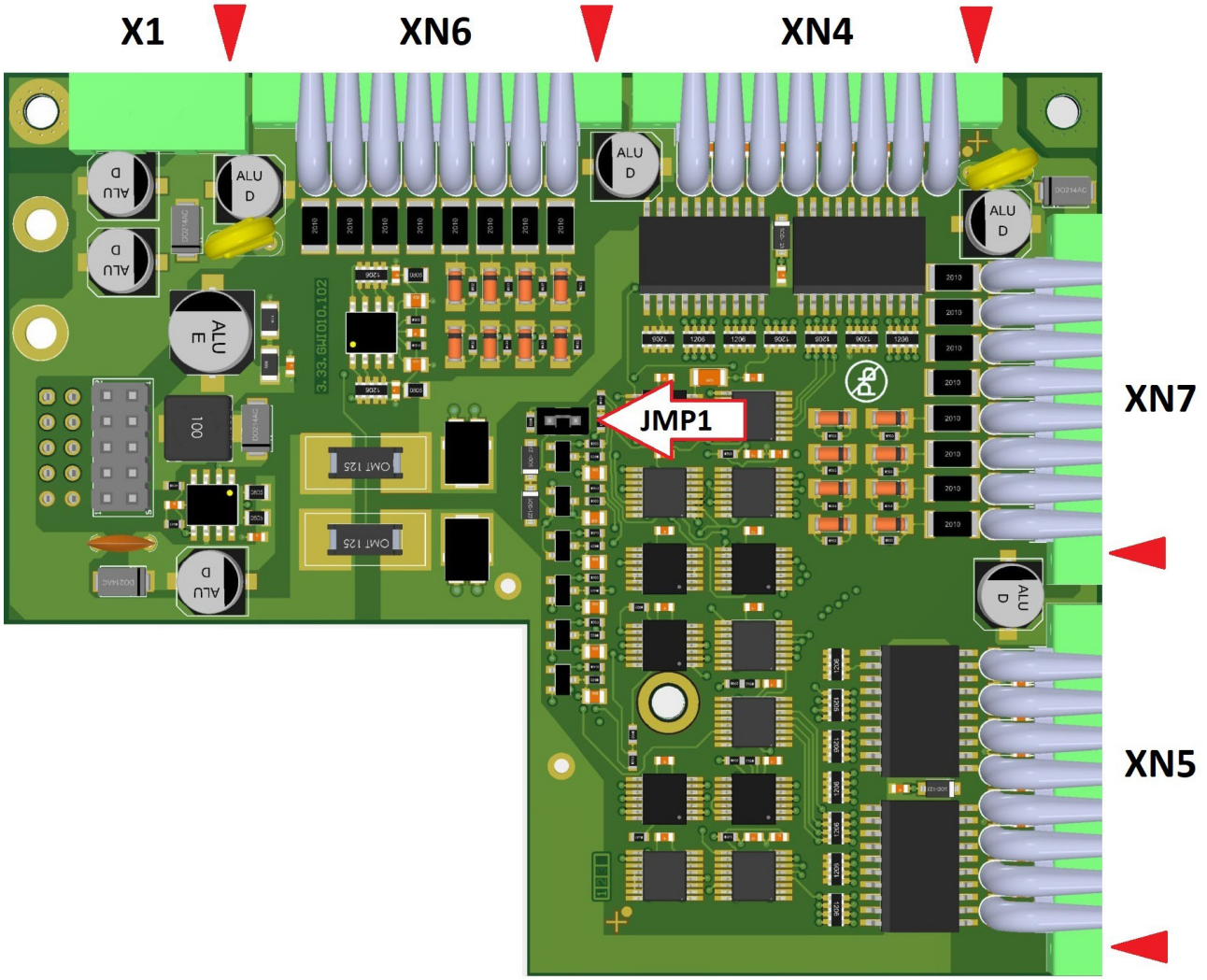
Opto-insulated, 24Vdc PNP, short circuit protected

Digital outputs connection schematic



Digital outputs electrical specifications		
Nominal current (logic state 1)	In (A)	0.5
Max current (logic state 1)	Max (A)	0.7
Available outputs	n.	8
Output voltage (logic state 1)	Max (V)	30
Drift current (logic state 0)	Max (A)	2
Nominal voltage	Vnom	24Vdc
Minimum output voltage	Vmin	19Vdc
Maximum output voltage	Vmax	28.8Vdc
Type	PNP	current source
Maximum output frequency	f	500 Hz
Protection	Short circuit	
Overcurrent/short circuit threshold	I (over-current)	> 0.11A min = 0.22A max
Overcurrent/short circuit intervention time	$tshort_{MAX}$	100µs @Vout = 30Vdc @RL = 0Ω

4 Connectors and wiring



4.1 Power supply – X1

4.1.1 Connection to DC power supply (PS)

Introduction PS connector allows wiring GWA device to a DC power supply. Please use a wire with 0.5 mm^2 (or greater) section (#21 AWG) to connect PS terminals; PS terminal wiring should meet industrial cabling standards locally applicable.

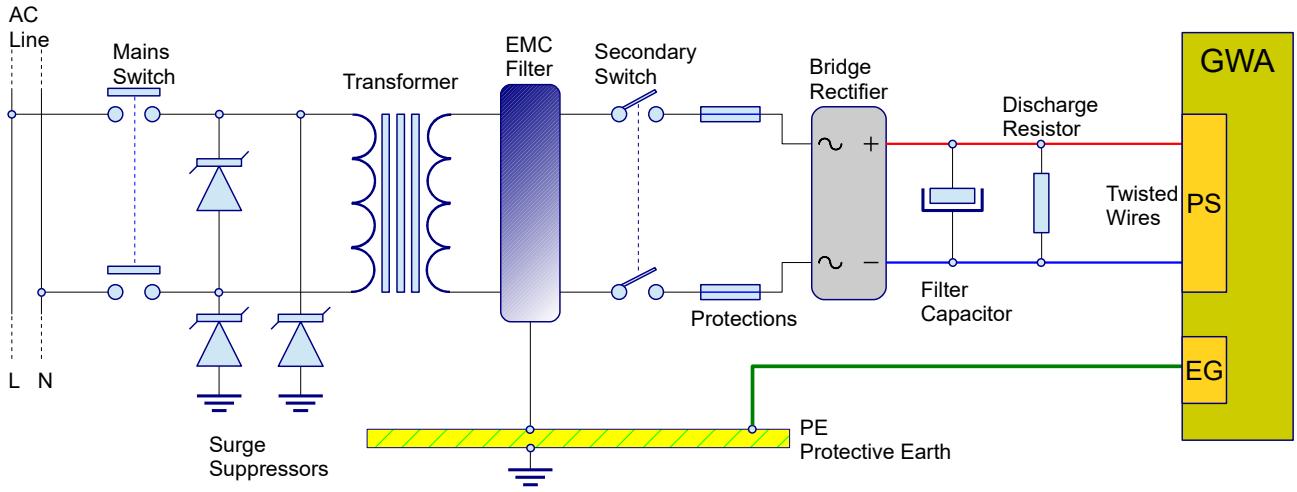
PS V+ Positive power terminal is X1.1

PS V- Return power terminal is X1.2

Attention EG and V- terminals are not internally connected; anyway they are dynamically linked by a parallel RC circuit (R=1MΩ, C=2.2nF).

Attention Please do not solder wire ends and then insert them in the connector; soldering may deteriorate and then cause a loss of electrical connection.

Connection diagram



4.1.2 Connection to protection ground (EG)

Connect EG terminal to the protection ground PE prior any other connection.

Cabling requirements Please use a wire with 0.5 mm^2 (or greater) section (#21 AWG) to connect EG terminal; such wire should have a section equal or greater than power supply wires section.
EG terminal wiring should meet industrial cabling standards locally applicable.

Earth ground EG terminal is X1.3

4.1.3 DC power supply connector description and pinout

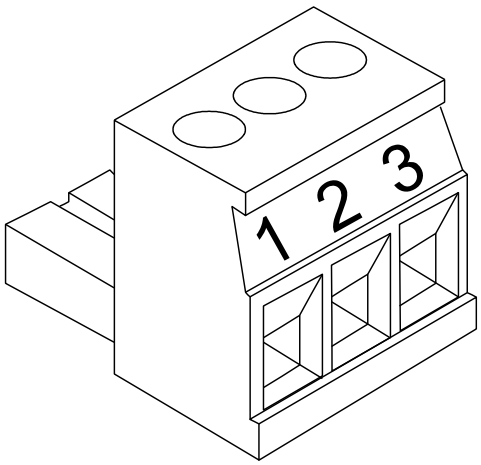
X1 is a Phoenix 3-pole male connector MSTBA 2,5/ 3-G-5,08 – 1757255
Mating female is Phoenix MSTB 2,5/ 3-ST-5,08 - 1757022

Attention This connector must be used to provide additional power to board Outputs when high current loads are connected.

Connections X1

Input	Pin	Description
V+	X1.1	DC power supply(+)
V-	X1.2	DC power supply reference (-)
EARTH	X1.3	Earth Ground

Pin assignment



4.2 Digital inputs - XN6 and XN7

Introduction GWA board is equipped with two 8 bit Digital Input interfaces, input signals are opto-isolated, 24Vdc, PNP/Push pull source compatible, available on XN6 and XN7 connectors.
A status LED for each input, driven by a light pipe immediately over the contact pin, is available as option, on request. The status LED is ON to indicate 24V present on input pin.

Please refer to software manual for information about I/O operation.

Cabling requirements Please use shielded cable wires with 1.0 mm^2 (#18AWG) or 0.5 mm^2 (#20AWG) section.

4.2.1 Digital Inputs XN6 and XN7 connector description and pinout

XN6 and XN7 are Phoenix 10-pole male connector MC 1,5/10-G-3,5 – 1844294
Mating female is Phoenix MC 1,5/10-ST-3,5 - 1840447

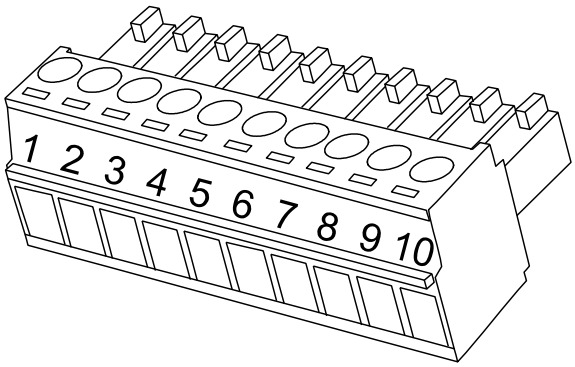
Connections XN6 – Inputs

Signal	Pin	Description
IN_GND	XN6.1	Common input GND
IN_0	XN6.2	Input 0
IN_1	XN6.3	Input 1
IN_2	XN6.4	Input 2
IN_3	XN6.5	Input 3
IN_4	XN6.6	Input 4
IN_5	XN6.7	Input 5
IN_6	XN6.8	Input 6
IN_7	XN6.9	Input 7
PWR_24V	XN6.10	+24V Output

Connections XN7 – Inputs

Signal	Pin	Description
IN_GND	XN7.1	Common input GND
IN_8	XN7.2	Input 8
IN_9	XN7.3	Input 9
IN_10	XN7.4	Input 10
IN_11	XN7.5	Input 11
IN_12	XN7.6	Input 12
IN_13	XN7.7	Input 13
IN_14	XN7.8	Input 14
IN_15	XN7.9	Input 15
PWR_24V	XN7.10	+24V Output

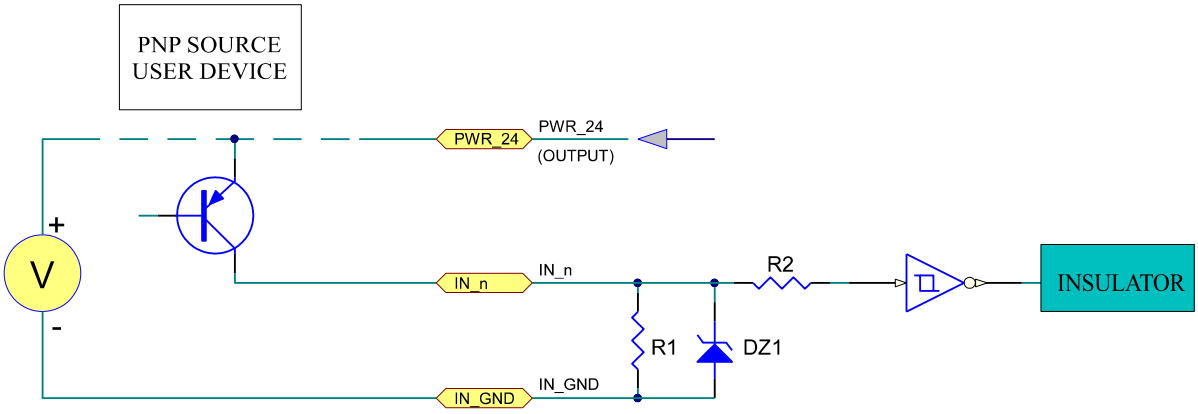
Pin assignment



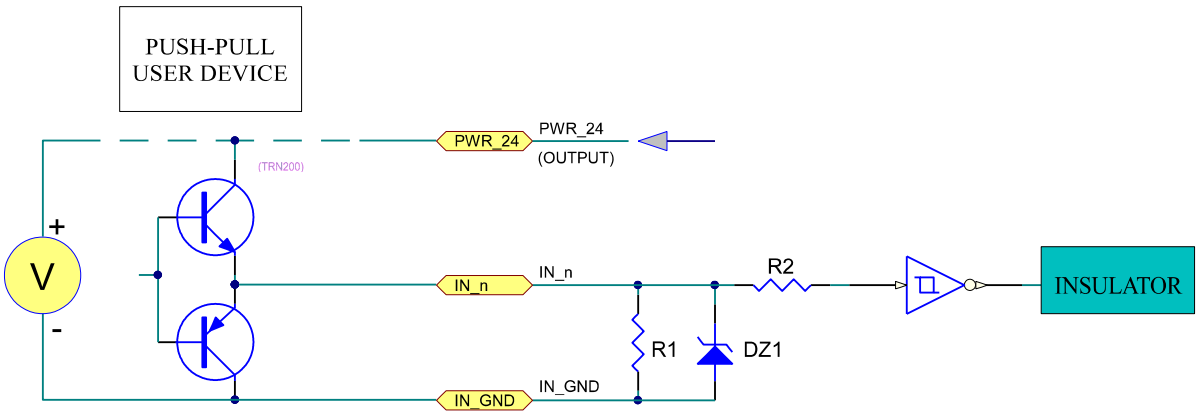
4.2.2 Digital inputs electrical connection

Depending upon external device output type, please adopt the most appropriate electrical connection scheme between those reported hereafter.

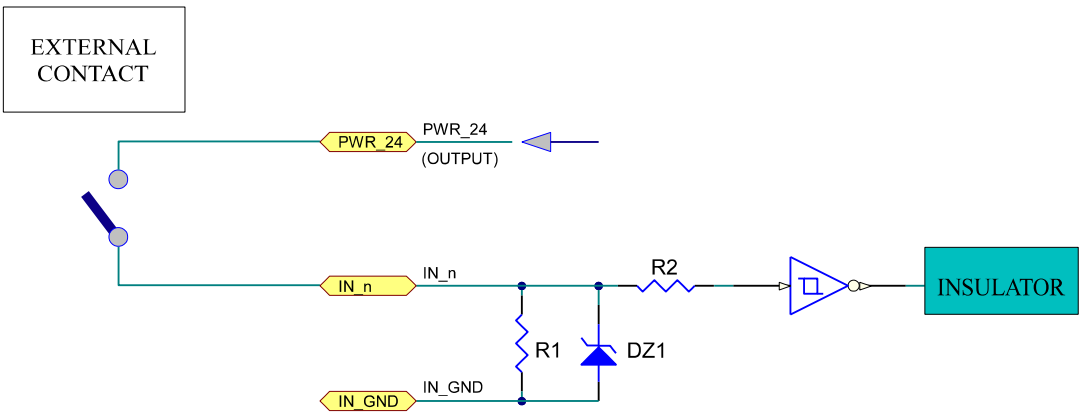
PNP source



Push-Pull source



Switch source



4.3 Digital outputs - XN4 and XN5

Introduction

GWA board is equipped with two 8 bit Digital Output interfaces, output signals are opto-isolated, 24Vdc, PNP, available on XN4 and XN5 connectors.
A status LED for each output, driven by a light pipe immediately over the contact pin, is available as option, on request. The status LED is ON to indicate 24V is present on output pin.
Each 8 bit Digital output block is protected from short circuit and failure electronically and by a 4A fuse.

Output Watchdog

An hardware watchdog circuit ensures the reset of outputs if they are not refreshed by firmware for more than 100 ms.
A jumper is provided to exclude the watchdog function during the firmware debug phase.

Please refer to software manual for information about I/O operation.

Cabling requirements

Please use shielded cable wires with 1.0 mm^2 (#18AWG) or 0.5 mm^2 (#20AWG) section.

4.3.1 Digital outputs connector description and pinout

XN4 and XN5 are Phoenix 10-pole male connector MC 1,5/10-G-3,5 – 1844294
Mating female is Phoenix MC 1,5/10-ST-3,5 - 1840447

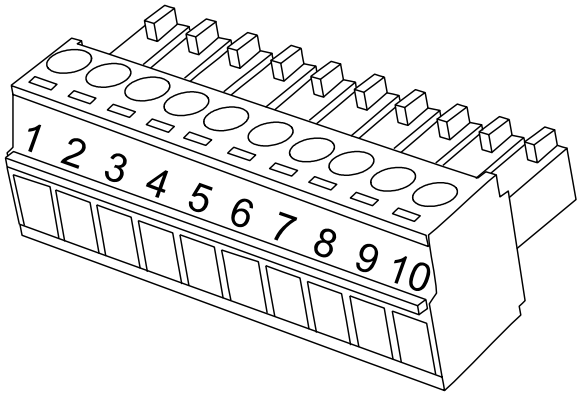
Connections XN4 – Outputs

Signal	Pin	Description
OUT_GND	XN4.1	Common output GND
OUT_0	XN4.2	Output 0
OUT_1	XN4.3	Output 1
OUT_2	XN4.4	Output 2
OUT_3	XN4.5	Output 3
OUT_4	XN4.6	Output 4
OUT_5	XN4.7	Output 5
OUT_6	XN4.8	Output 6
OUT_7	XN4.9	Output 7
PWR_24V	XN4.10	+24V Input power to Output driver (fused)

Connections XN5 – Outputs

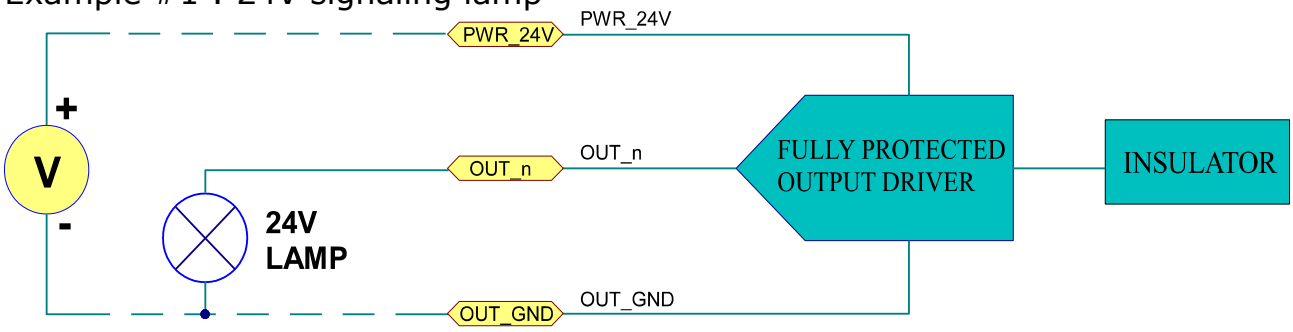
Signal	Pin	Description
OUT_GND	XN5.1	Common output GND
OUT_8	XN5.2	Output 8
OUT_9	XN5.3	Output 9
OUT_10	XN5.4	Output 10
OUT_11	XN5.5	Output 11
OUT_12	XN5.6	Output 12
OUT_13	XN5.7	Output 13
OUT_14	XN5.8	Output 14
OUT_15	XN5.9	Output 15
PWR_24V	XN5.10	+24V Input power to Output driver (fused)

Pin assignment

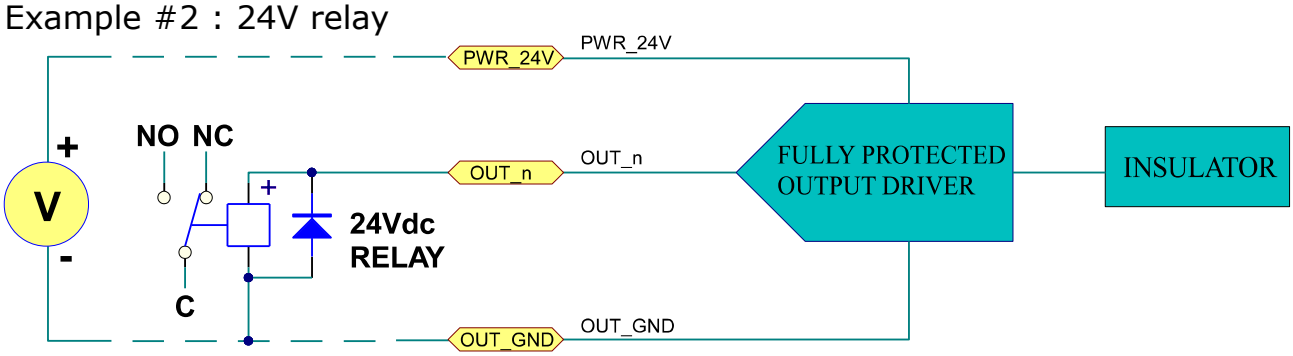


4.3.2 Digital outputs electrical connection

Example #1 : 24V signaling lamp



Example #2 : 24V relay



5 GXIO10 STM32 pin reference

GWIO v.1.00			
Subsystem	Signal Name	Port	Type
IO BUS			
	BUS_LD	PG15	OUT PP
	BUS_ID/VERS	PF10 (SEE VERS. TABLE)	OUT PP
	BUS_RST/XVERS	PF9 (SEE VERS. TABLE)	OUT PP
	SPI1_MISO	PA6	IN
	SPI1_MOSI	PB5	OUT PP
	SPI1_SCK	PA5	OUT PP
Types Legenda			
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		