TECNO
LOGIX
ENGINEERING AND AUTOMATION

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GWC _ _ _ _

INSTALLATION, USE, AND SERVICE MANUAL

Ver.	Verified	FA		Date
0.1				
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Approved				

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GWC

Note :

1. INTRODUCTION

This section introduces main features of GWCnnnn product as part of an industrial automation system.

1.1.   Automation system components
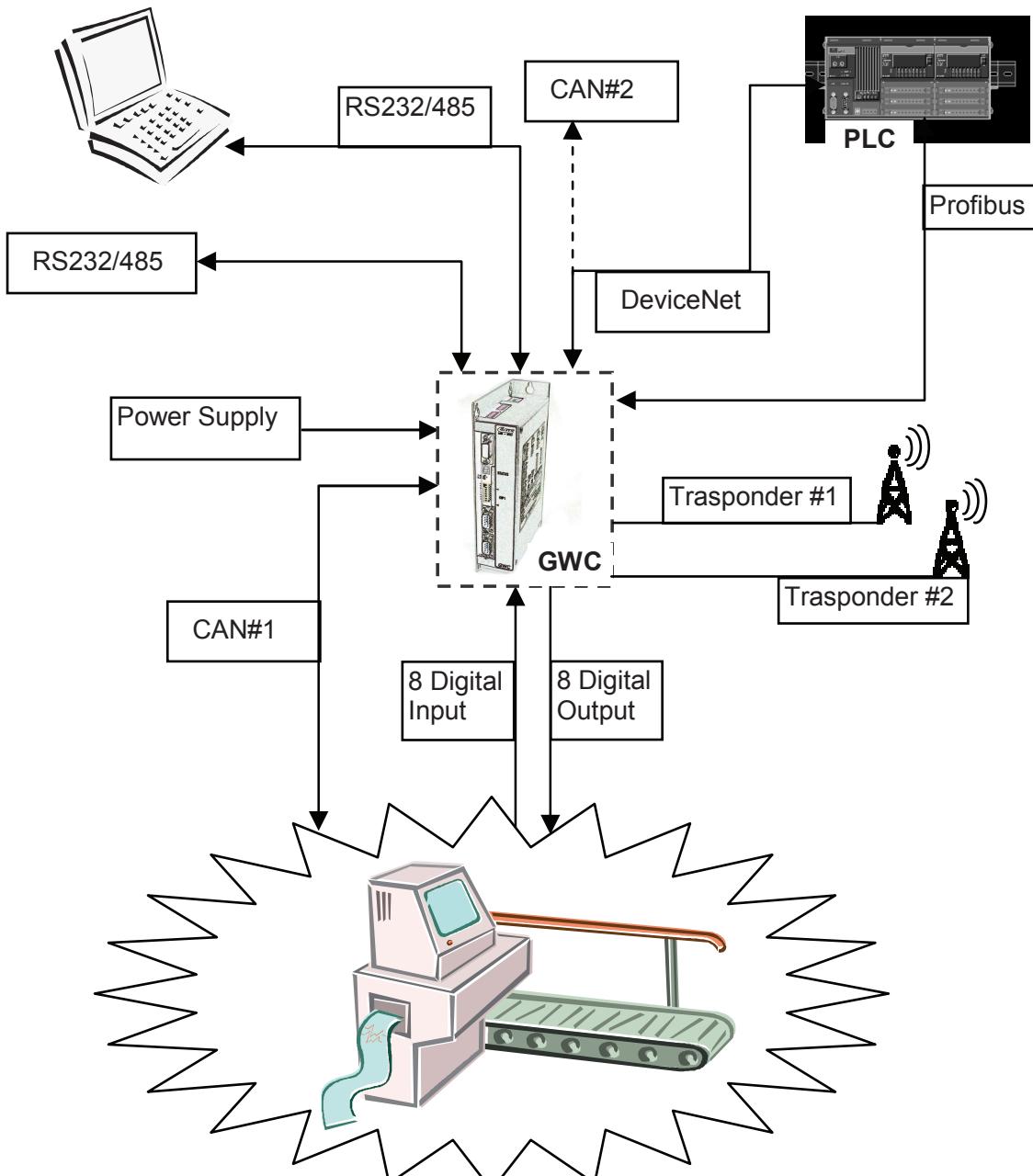
Please refer to section A.2 for details related to power supply.

1.2. GWC: description

GWC system has been designed to accomplish two main functions:
- Communication protocol converter/adapter (gateway)
- Programmable I/O device

The *communication protocol converter/adapter* function allows different field buses – such as CanOpen, DeviceNet, ProfiBus, ModeBus, and in the future Ethernet, to be handled/interfaced.
The *programmable I/O device* function allows user to write an automation procedure that will be executed by the GWC device.
Such automation procedure can interface both digital and analog I/Os available on the GWC device.
Both functions could coexist on the same device, allowing user a whole range of possibilities to automate an industrial process.

GWC device is designed to guarantee enforceability of EN61800-3 and 60204-1 rules: to satisfy such rules user must guarantee connections characteristics compliant with EMC immunity and emission, such as a ground connection, a correct installation and a power supply filter.
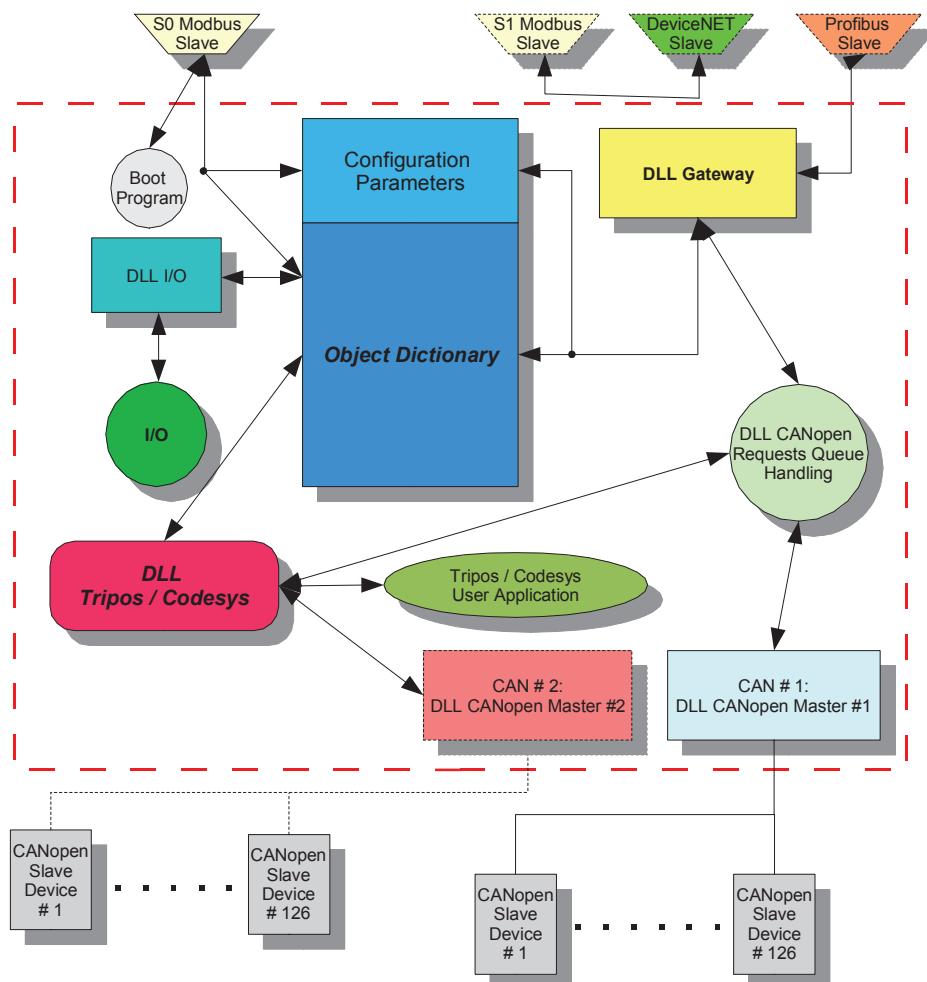
Figure 1: GWCxxxx functional block diagram

1.3.   GWC hardware

Figure 2 shows the hardware block diagram of a GWC device.

> **i** This manual holds information about installation, start-up and service of a GWC device. Please note that some function could be missing, depending on the GWC device version.

GW00 : Main Board

Single DC Input Supply Isolated DC to DC Converter **CN1**		
Controller User Dip-Switches 7segm Display		
1 Ext. Flash Memory (up to 2Mbytes)	**2** Ext. Fast SRAM Memory (up to 1Mbytes)	**3** Ext. EEprom Memory (up to 32Kbytes)
4 CanOpen#1 Interface (1) **CN2**	**7** ModBus#1 RS232/485 Interface (1) **CN4**	**9** Fast PNP Digital Inputs (8) **CN6**
5 CanOpen#2 (5A) or DeviceNet (5B) Interface (1) **CN3**	**8** ModBus#2 RS232/485 Interface (1) **CN5**	**10** Source (PNP) Digital Outputs (8) **CN7**
6 ProfiBus Interface (1) **CN8**	**11** TRASPONDER#1 Interface (1) **CN12**	**12** TRASPONDER#2 Interface (1) **CN13**

Figure 2: GWCnnnn device hardware block diagram

1.4. Operating limits, risks and warnings

- Installation of a GWC device must comply with information reported in this manual.
- TECNOLOGIX is not responsible for damages and injuries caused by an improper use or by a not compliant use of a GWC device.
- GWC device is intended for installation in an electrical panel; it is user responsibility to guarantee appropriate working conditions to the GWC device.
- This manual intended audience is GWC device installer personnel; it is not intended to be support documentation for GWC device end users.

Attention

Only qualified Electro-personnel

A safe and effective installation is possible only when it is done in accordance with IEC 1000, EN 60204-1, EN 61800-3 standards, and the safety legislation in the end user installation field.

When performing insulation test on a system including a GWC device, please be sure to do not exceed GWC device maximum insulation voltages.

GWC device could cause environmental damages if not disposed properly.

1.5. Limited Warranty

TECNOLOGIX s.r.l., ("TECNOLOGIX") warrants to the buyer ("Buyer") of a TECNOLOGIX motor or driver (the "Product") as follows: when properly used and installed, the product will be free from substantial defects in material and workmanship, and will substantially conform to buyer specifications for the Warranty Period of 1 year. The Warranty commences on the manufacturing date printed on the Product label.

In no cases TECNOLOGIX will be responsible, during the Warranty Period, of a Product not properly stored, installed, used or serviced.

In no cases TECNOLOGIX will be responsible, during the Warranty Period, of a Product modified, setup or serviced without written authorization by others.

TECNOLOGIX responsibility is limited to service (or replacement) of any manufactured product, in whole or in part, that will result defective due to materials or workmanship, according to TECNOLOGIX warranty conditions.

The content of this manual is updated to its printing date. TECNOLOGIX reserves the right to modify or change its product to improve their performances without any notice or change to this manual.

TECNOLOGIX does not recommend usage of its products in life support application or in any case in which a fault can could threaten life of safety of persons or things.
If Buyer will use TECNOLOGIX products in this kind of application it will be the sole responsible of such use.
In such cases TECNOLOGIX will reserve the right to ask the Buyer for compensation of all caused damages, material and immaterial.

1.6. Symbols

Symbols used in this manual :

|		
	Danger Warning Caution	Used when user life or health could be exposed to a potential danger or when a potential damage to devices or materials are possible.
	Attention	Special instruction for a safe and effecient installation and use
	Information	Used to highlight important additional information
		An essential element to fulfil limits specified by EMC guidelines is to be compliant with EMC installation rules.

2. Specifications

2.1. Mechanical specs (units: mm)

Wall mount

TOP VIEW

SIDE VIEW

BOTTOM VIEW

FRONT VIEW
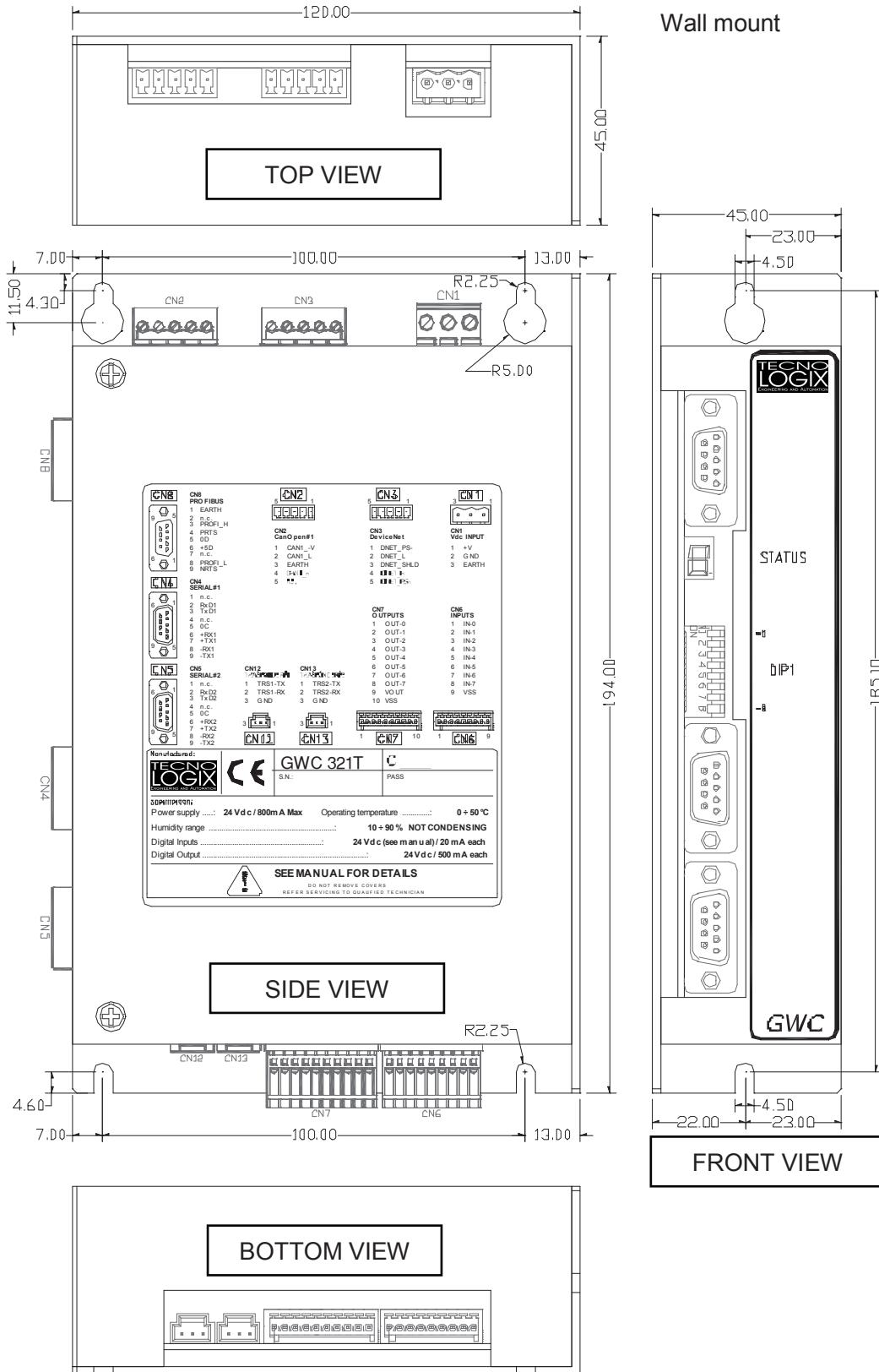
To mount on DIN Omega guide

SIDE VIEW

BACK VIEW

mollette

guida DIN tipo Omega

parete di fondo
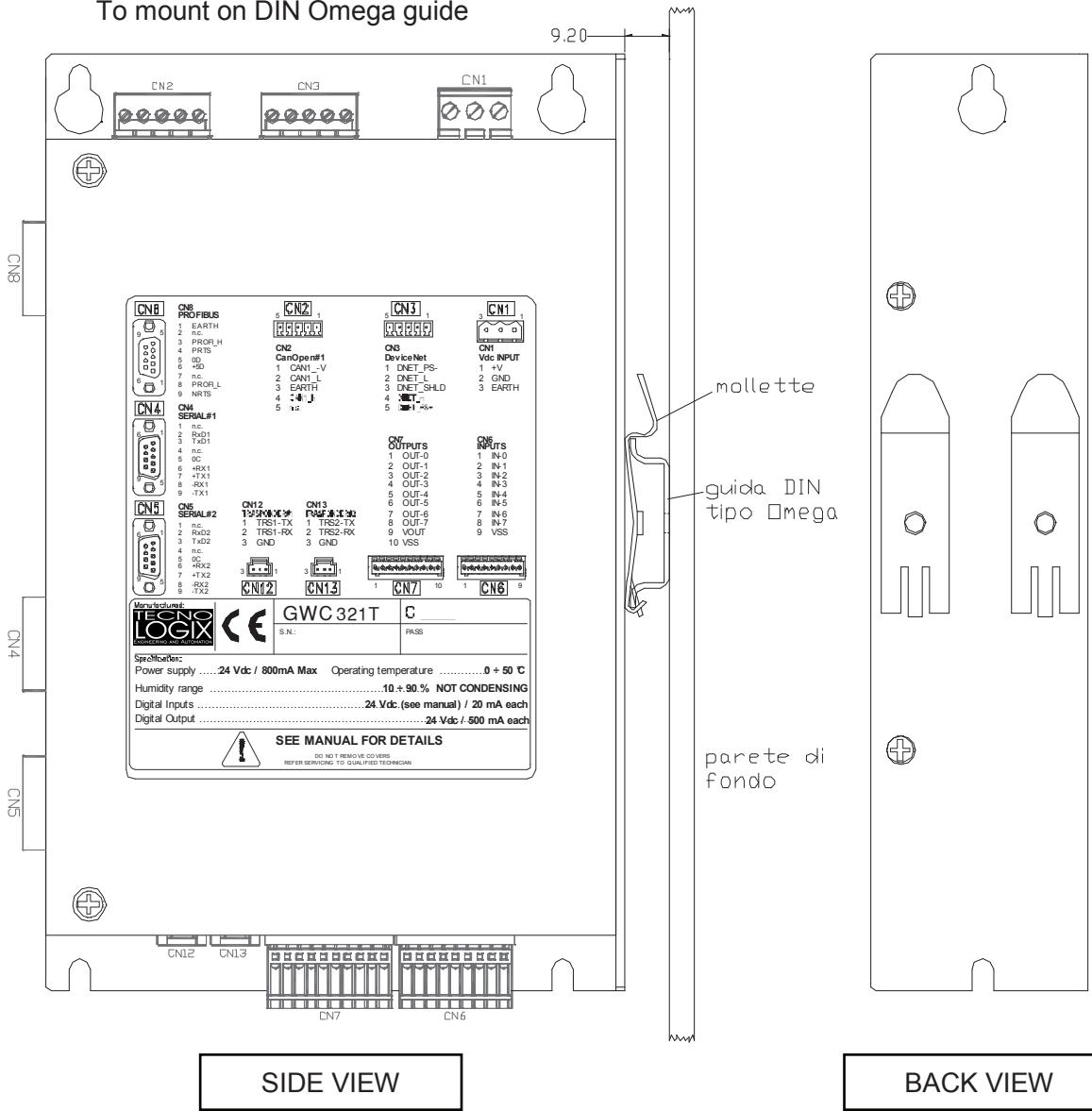
GWC device can be installed in 3 different ways:
a) Narrow side wall mount;
b) Wide side wall mount;
c) DIN "U" guide mount (back clips on request)

To install the device, please use:
- #2 or #4 MA4 screws and washers for type a) or type b) mount
- No screws are needed for type c) mount
- Dimensions   194(H) x 45(W) x 120(D) mm
- Weight   380g (w/o metal box)
                        480g (w/ metal box)
                        800g (w/ metal box and expansion board)
- Protection class   IP 20
- Storage temperatures from - 25°C to +55°C
- Working temperatures from 5 to 50°C
- Humidity   from 5% to 85% non condensing
- Max working altitude 1000 m s.l.

2.2.   Electrical specs

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

2.2.1.   Power supply characteristics

Please refer to chapter 5 and Appendix A for current product version power supply specifications*.*

2.2.2.   I/O electrical specifications

Digital inputs opto-insulated, 200kHz bandwidth, 24Vdc PNP/Push-Pull (5Vdc upon request).

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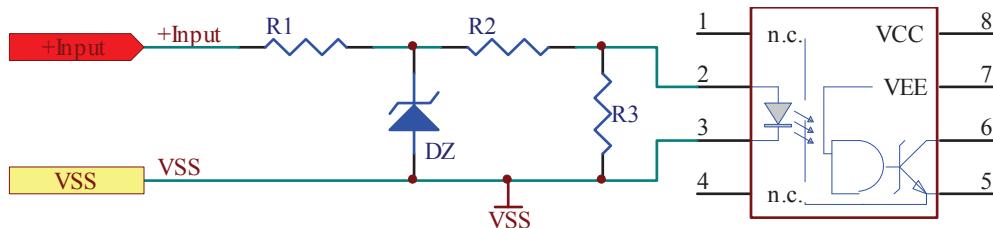
To avoid damages to input circuitry, please do not exceed minimum and maximum ratings reported in the following table:

| Digital input					
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$_{MAX}$		200kHz			
Protections		Protected against polarity inversion			

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

Digital inputs electrical connection

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

PNP source

Push-Pull source
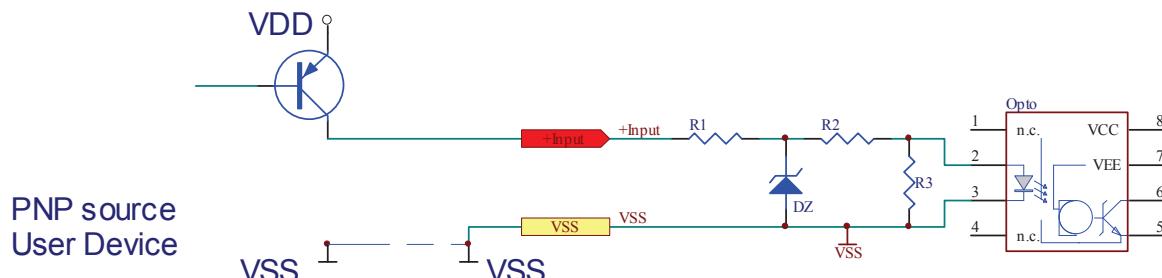
Push-pull source
User Device
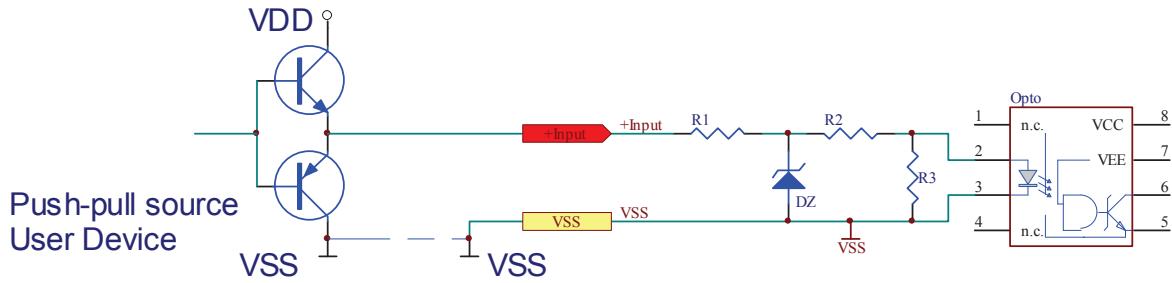
24Vdc PNP opto-insulated, short circuit protected, digital output.

Specifiche elettriche di uscita		
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)	3
Drift current (logic state 0)	Max (A)	2
Nominal voltage	Vnom	24Vdc
Minimum output voltage	Vmin	19Vdc
Maximum output voltage	Vmax	28.8Vdc
Tipo	PNP	current source
Maximum output frequency	f	1kHz
Protections	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
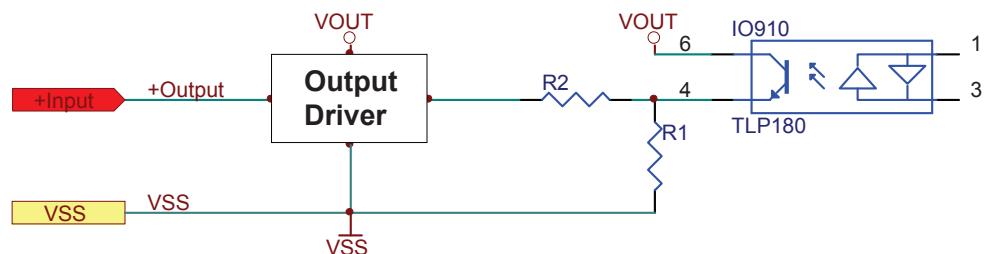
2.2.3. CAN Bus – CANOpen Interface

Introduction CAN Bus interface allows a multipoint connection according to ISO 11898 standard.
The interface is insulated and it is powered by an on board insulated DC/DC converter, so no external power source is needed.

> **i** **Please refer to section 5** for information about the available controller.
> **Please refer to software manual** for information related to how CAN Bus interface operates.

CANbus network connection

Network parameters						
Parameters	**Symbol in figure**	**Unit**	**Value**			**Conditions**
			Min.	**Nom.**	**Max.**	
Bus length	L	M	0		40	
Branch length	I	M	0		0.3	Bit rate: 1Mbit/sec
Distance between adjacent nodes	D	M	0.1		40	

| Cable length	Baudrate [kbit/s]
< 25m	1000
< 50m	800
< 100m	500
< 250m	250
< 500m	125
< 1000m	50
< 2500m	20

2.2.4.   CAN Bus – DeviceNet Interface

Introduction   CAN Bus interface allows a multipoint connection according to ISO 11898 standard.
The interface is insulated and it is powered by an on board insulated DC/DC converter, so no external power source is needed.

> **i**
> **Please refer to section 5** for information about the available controller.
> **Please refer to software manual** for information related to how CAN Bus interface operates.

CANbus network connection

Network parameters						
Parameters	**Symbol in figure**	**Unit**	**Value**			**Conditions**
			Min.	**Nom.**	**Max.**	
Bus length	L	M	0		40	
Branch length	l	M	0		0.3	Bit rate: 1Mbit/sec
Distance between adjacent nodes	D	M	0.1		40	

Cable length	Baudrate [kbit/s]
< 25m	1000
< 50m	800
< 100m	500
< 250m	250
< 500m	125
< 1000m	50
< 2500m	20

2.2.5. PROFIBUS DP Interface

Introduction   PROFIBUS DP interface @todo
The interface is insulated and it is powered by an on board insulated DC/DC converter, so no external power source is needed.

Please refer to section 5 for information about the available controller.
Please refer to software manual for information related to how serial interface operates.

Cabling requirements   Please use a 0.5mm^2 (#20 AWG) or a 0.25mm^2 (#23AWG) twisted pair for PROFIBUS DP interface connection

2.2.6. RS232/RS485 Interface

Introduction   RS232 allows a point-to-point link, whilst the RS485 allows a multipoint link, according to EIA/TIA232E CCIT V.28 e RS-485 CCITT V.11 X.27 standards.
The interface is insulated and it is powered by an on board insulated DC/DC converter, so no external power source is needed.

Please refer to section 5 for information about the available controller.
Please refer to software manual for information related to how serial interface operates.

Cabling requirements   Please use a 0.5mm^2 (#20 AWG) or a 0.25mm^2 (#23AWG) twisted pair for RS232/RS485 interface connection

3. CONTROLLER INSTALLATION

This section describes how to install the controller (a.k.a. GWC device). Main activities are:

- Remove external package and visually inspect the provided device;
- User parameters' setup;
- Setup and use of the controller safely;
- Controller mounting;
- Controller connection;

Please refer to system diagram in section 1.3.

3.1. Package removal, inspection and storage

Please verify that controller package contains all ordered parts; the label on the controller metal box should report the serial number, the version, and manufacture date.

Please inspect the controller: each problem caused by a not appropriate handling/delivering must be immediately submitted to transporter.

Please store the controller in a place compliant with specified requirements.

3.2. User parameters: dip-switches setup

Locating dip-switches	DIP1 contacts can be used to perform some user setup, such as: • CANBus node id setup • CANBus baudrate setup • User functions setup DIP1 contacts are accessible from front side of the GWC device. Dip-switches functions are defined by software; please refer to the Software Manual for detailed information

3.3. Setup and use the controller safely

Guide   GWC device should be installed only by qualified personnel who are fully familiar with the content of this manual. Setup instruction should be followed and approved and any doubt about them should be clarified in advance with GWC device supplier before any use.

In no case TECNOLOGIX will be chargeable for direct or indirect damages caused by an improper installation, setup, use or unauthorized modification of the GWC device.

To avoid personal damages or injury while working with the GWC device, please:

- do not power on the GWC device if the shell is not yet connected to PE protection ground (see appropriate connection point on CN1 connector).

- Verify that PE protection ground impedance is compliant with local security laws.

- do not connect anything directly to internal circuitry.

- avoid connection or disconnecting anything while the GWC device is powered on.

Please disconnect power before any setup or service operation.

3.4. Device fitting

Environment

The environment where the GWC device will fit should be clean, with no corrosive vapours, gases, or liquid.

Please avoid device fitting in places where vapours or humidity should condense.

By fitting the GWC device into a cabinet, please be sure that the air flow or the cooling system should be sufficient to keep GWC device temperature below its maximum temperature ratings.

Current laws on safety must be considered as a design requirement for the device installation.

Installation guide

Device installation should satisfy at least following requirements:
- Keep device vertical;
- Avoid excessive vibrations or mechanical shocks;
- Leave enough free room to allow air flows on device top and bottom

Cooling

Device cooling is guaranteed by its metal box surfaces; please optimize thermal flow between those surfaces and the environment so that internal temperature is always kept below its maximum temperature ratings.

Minimum distances
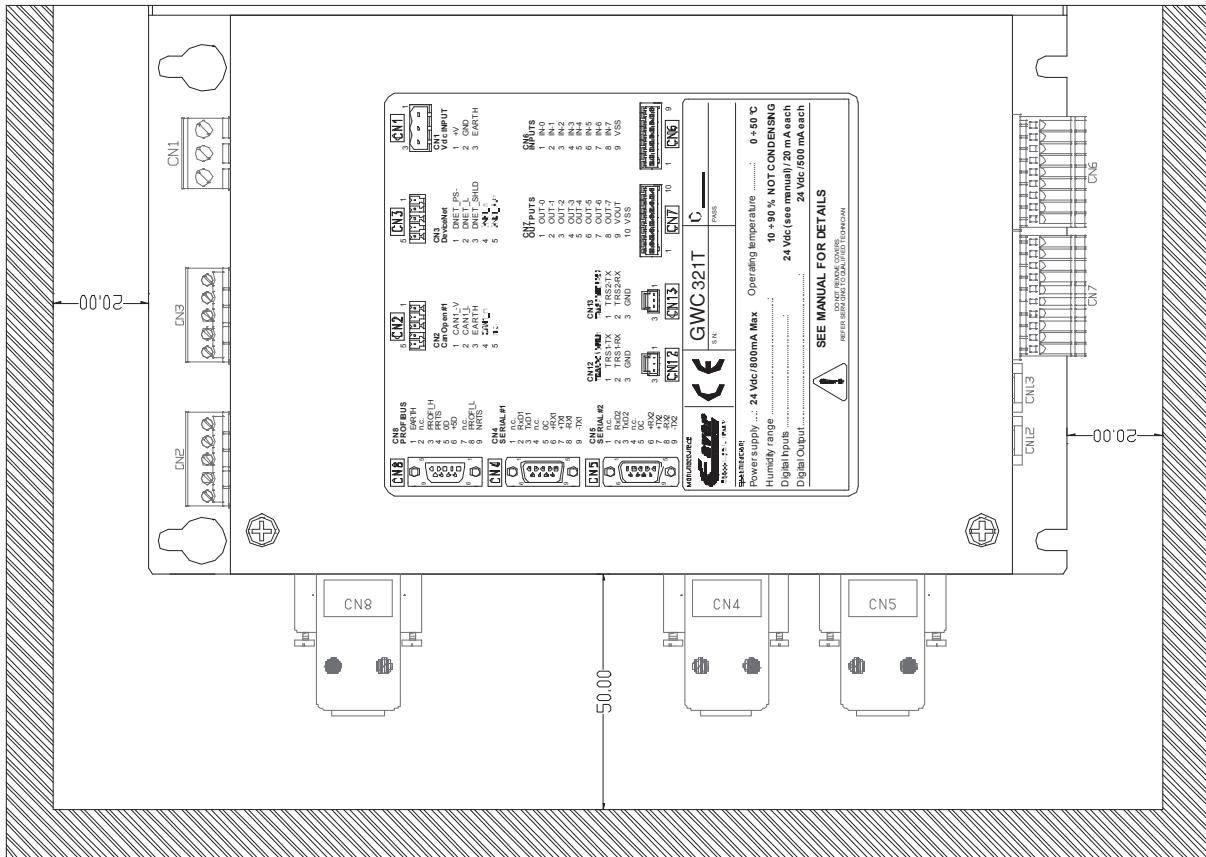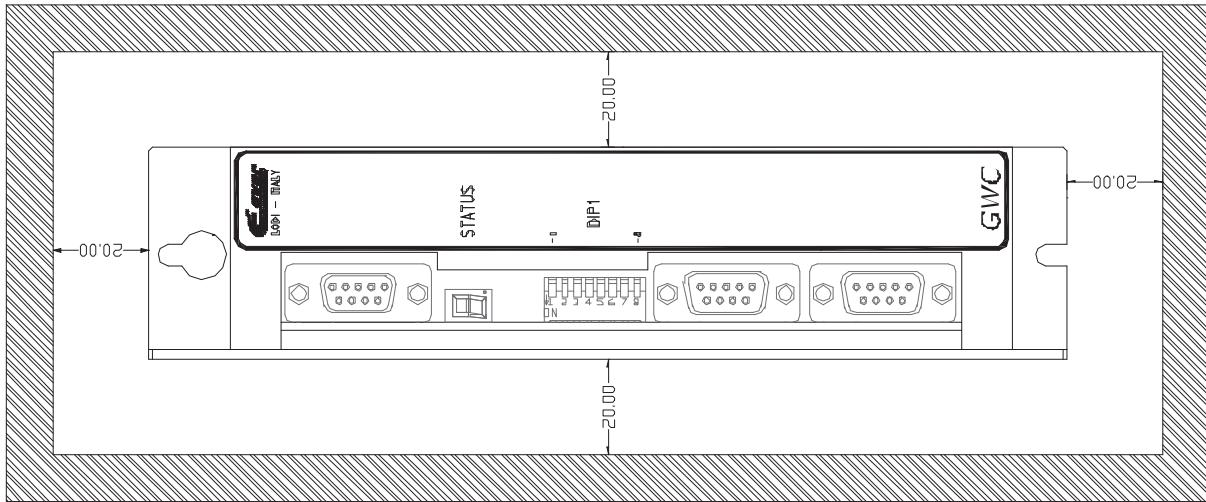
3.5.   GWC wiring

GWC available connectors and possible wiring:

CN1   DC Input Supply + Protection Ground PE
CN2   CanOpen #1
CN3   DeviceNet or CanOpen #2
CN4   RS232/485#1
CN5   RS232/485#2
CN6   Digital Inputs
CN7   Digital Outputs
CN8   ProfiBus
CN12 Trasponder#1
CN13 Trasponder#2
          (*)features depending on specific GWC device version

Connectors location
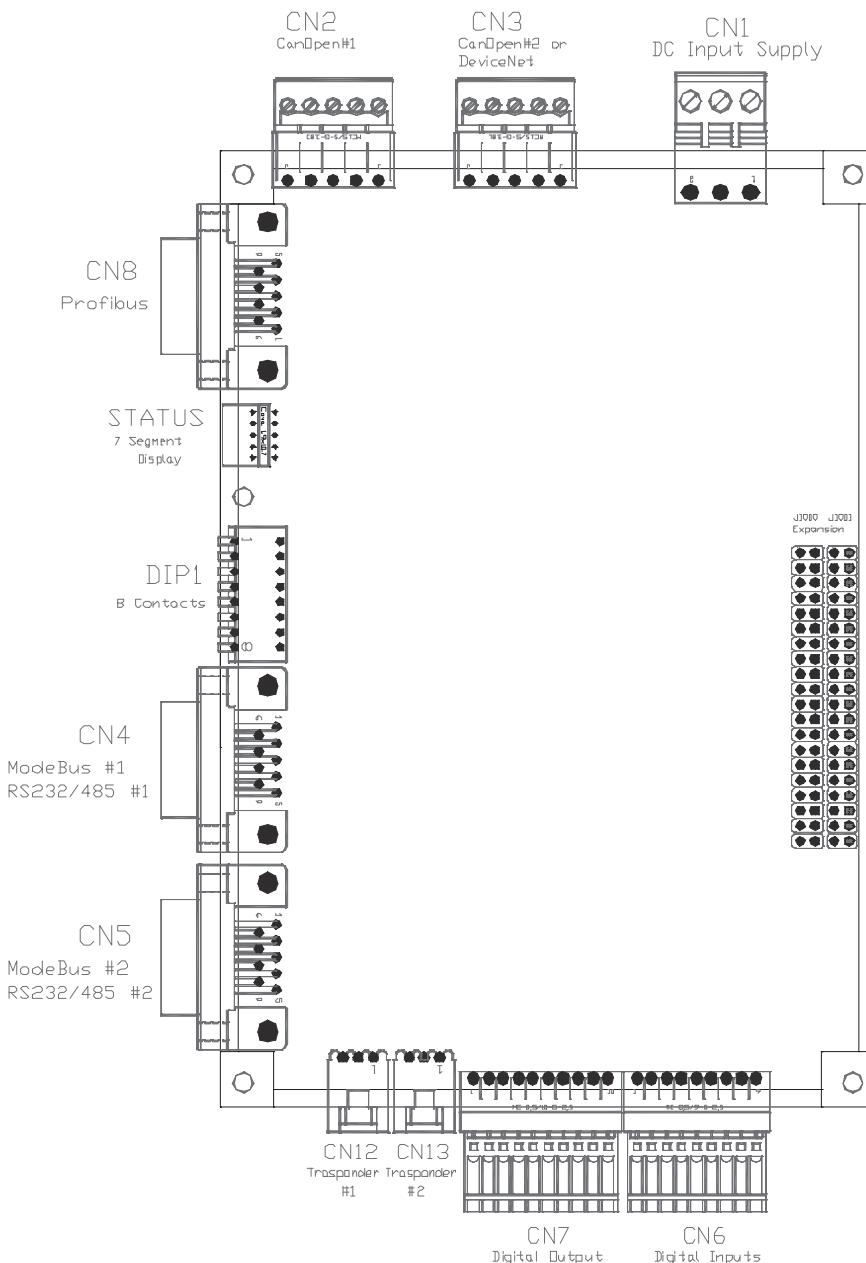
Wiring is specific for a given application

EMC

Wiring rules and protection ground connection and shielding techniques should be appropriate for most applications.

A good noise immunity could be obtained by twisting and shielding electric cables.
Further improvements could be obtained by separating signal and power lines.

Local lows on electrical safety, special working conditions and specific cabling standards should have precedence on information reported in this manual.

Connection diagram
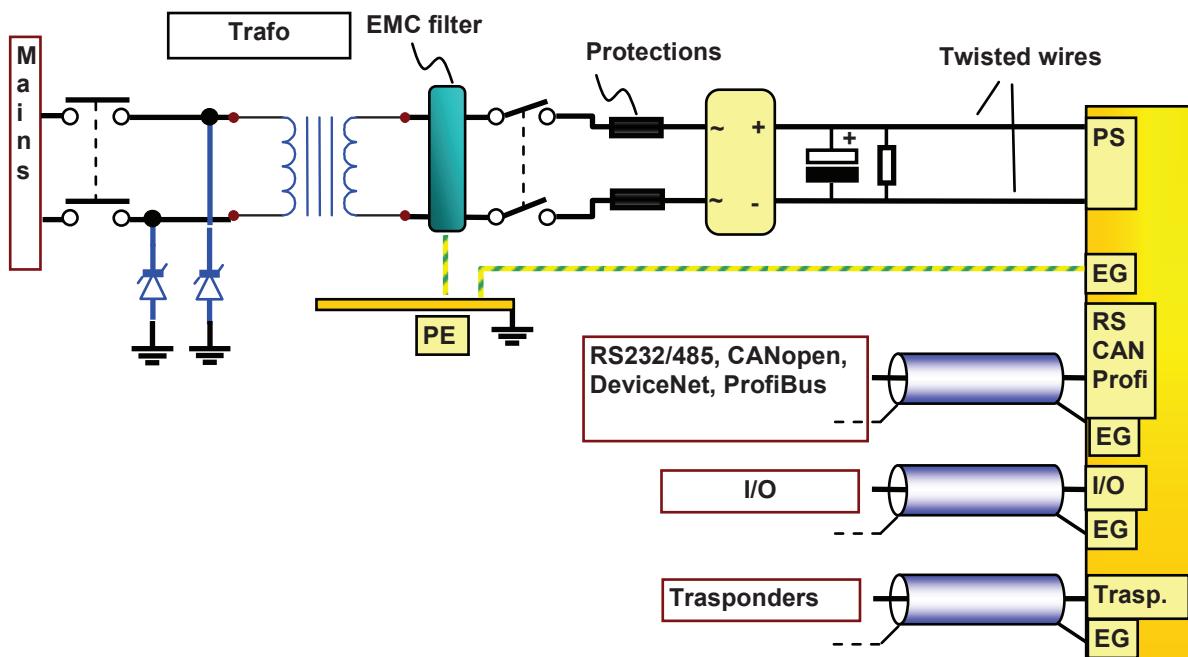
3.5.1.   CN1: Connection to protection ground (EG)

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

Wiring requirements

Please use a wire having 0.5mm^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 a PHOENIX COMBICON 1757255 3-poles male connector

EG terminal is a PHOENIX COMBICON 1757255 3-poles male connector

Phoenix Combicon 1757022
3-poles female 5.08 mm

1
2
3 EG

To PE   **To CN1**
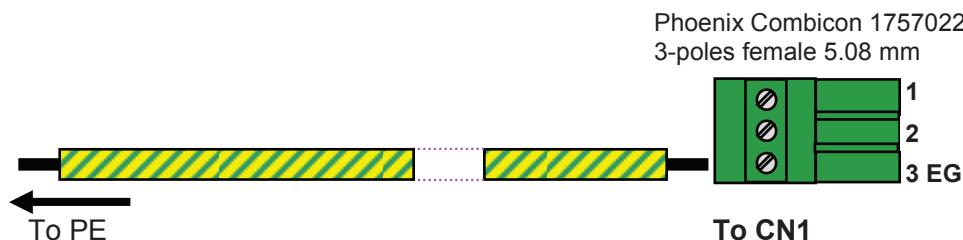
Input	Pin	Description
V+	CN1.1	DC power supply(+)
V-	CN1.2	DC power supply reference (-)
EARTH	CN1.3	Earth Ground

3.5.2.   CN1: Connection to DC power supply (PS)

Introduction   PS connector allows wiring GWC device to a DC power supply source.

PS connector is a PHOENIX COMBICON 1757255 3-poles male connector
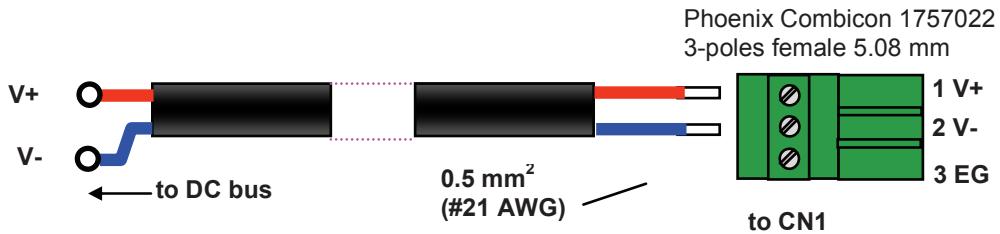
> **EG** and **V-** terminals <u>are not internally connected</u>; anyway they are dynamically linked by a parallel RC circuit (R=1MΩ, C=2.2nF)

> 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
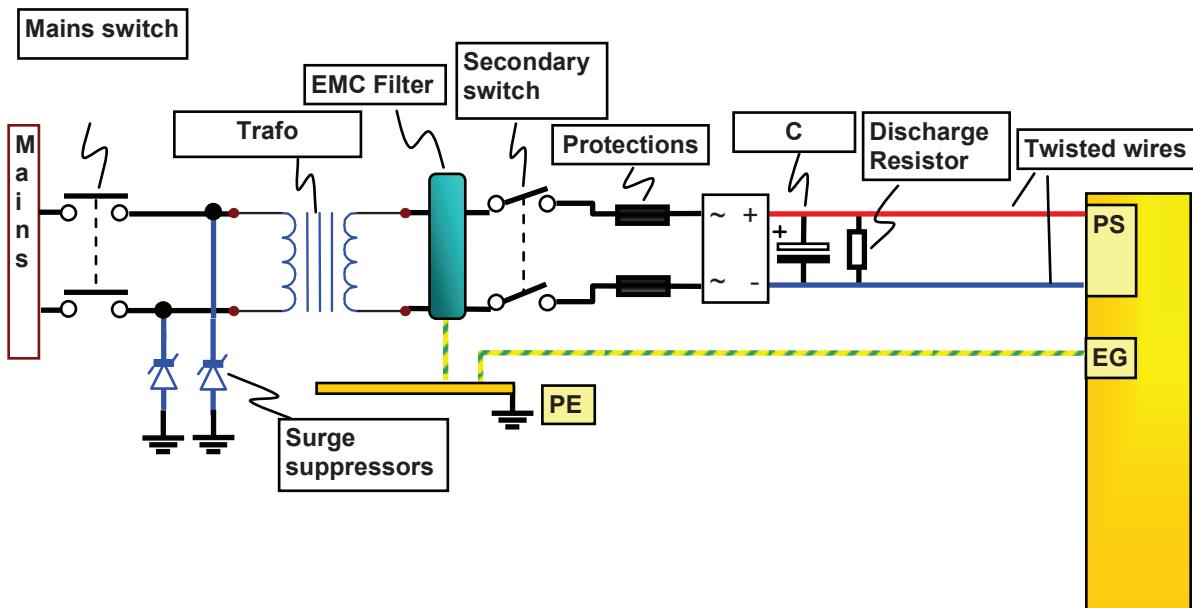
Please refer to section **A.2** for further information about DC power supply sizing.

Protections

Protections should be realized by mean of a delay fuse or an automatic protection switch. Sizing of those devices depends upon current sunk by connected DC loads.

Dissect mains from transformer primary circuit.

Power supply must not exceed connected loads allowed range.

Please refer to section 5 for further information about your specific GWC device power supply allowed range.

Wiring requirements

Please use a wire having $0.5mm^2$ or greater section (#21 AWG) to connect V+ and V- terminals.

3.5.3.   CN2: CanOpen connection #1

Can Bus   CN2 is a PHOENIX mini-COMBICON 1803303 5-poles male connector.
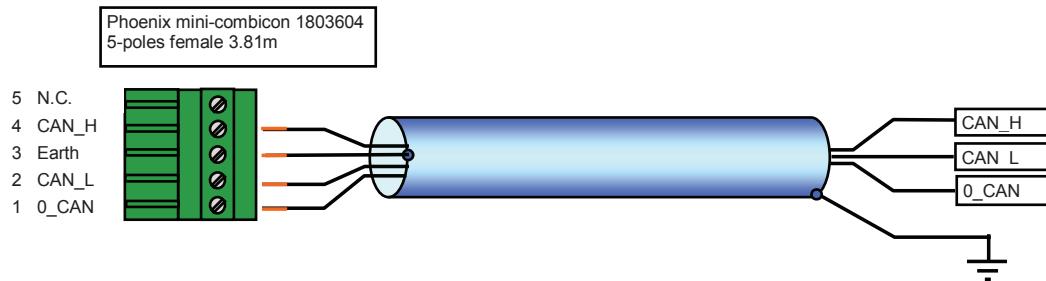
Phoenix mini-combicon 1803604
5-poles female 3.81m

```
5  N.C.
4  CAN_H                                                    CAN_H
3  Earth                                                    CAN_L
2  CAN_L                                                    0_CAN
1  0_CAN
```

Please refer to software manual for further information about how GWC device works when in CAN bus mode

Connection table

Signal name	Pin	Function
0_CAN	CN2.1	Can_Ground
CAN_L	CN2.2	CAN_L signal
Earth	CN2.3	Can_ Shield
CAN_H	CN2.4	CAN_H signal
N.C.	CN2.5	N.C.

Wiring requirements   Please use twisted wires having $0.5mm^2$ (#20AWG) or $0.25mm^2$ (#23AWG) section for CAN bus connection.

CANBus network schema

Please note that the 1st and the last node in the network must have a 120Ω ending resistor. CAN_Ground connection is an option.
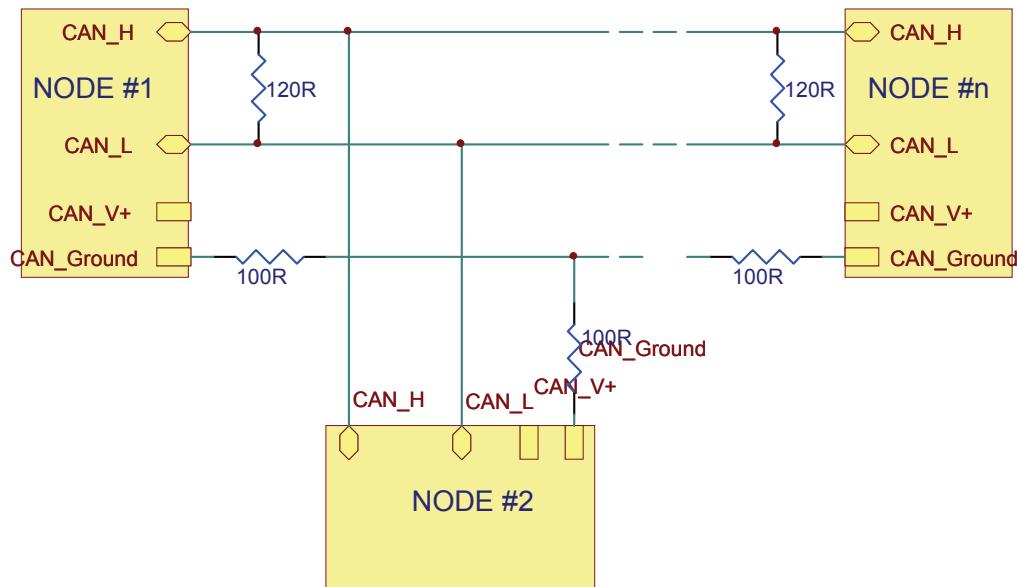
3.5.4. CN3: DeviceNet (or CanOpen #2) connection

Can Bus CN3 is a PHOENIX mini-COMBICON 1803303 5-poles male connector.

Phoenix mini-combicon 1803604
5-poles female 3.81m

5 DNET_V+
4 DNET_H
3 DNET_SLD
2 DNET_L
1 DNET_V-

DNET_V+
DNET_H
DNET_L
DNET_V-
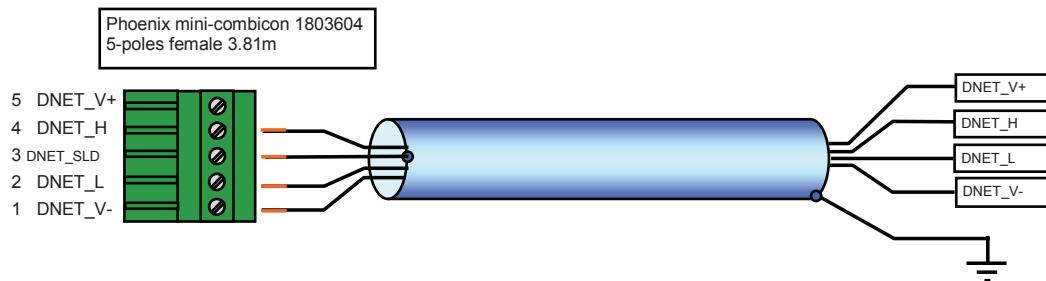
> **i** If used as CANOpen#2 please refer to *§3.5.3 CN2: CanOpen connection #1* for more information about connection table and wiring.

> **i** Please refer to software manual for further information about how GWC device works when in DeviceNet or CAN bus mode.

Connection table

| Signal	Pin	Function
DNET_V-	CN3.1	DNET_Ground
DNET_L	CN3.2	DNET CAN_L signal
DNET_SHIELD	CN3.3	DNET_ Shield
DNET_H	CN3.4	DNET CAN_H signal
DNET_V+	CN3.5	DNET Positive Supply

Wiring requirements Please use cables compliant to DeviceNet association requirements for DeviceNet connection.
Please use twisted wires having 0.5mm^2 (#20AWG) or 0.25mm^2 (#23AWG) section for CAN bus connection.

DeviceNet network schema

Please note that the 1st and the last node in the network must have a 120Ω ending resistor.
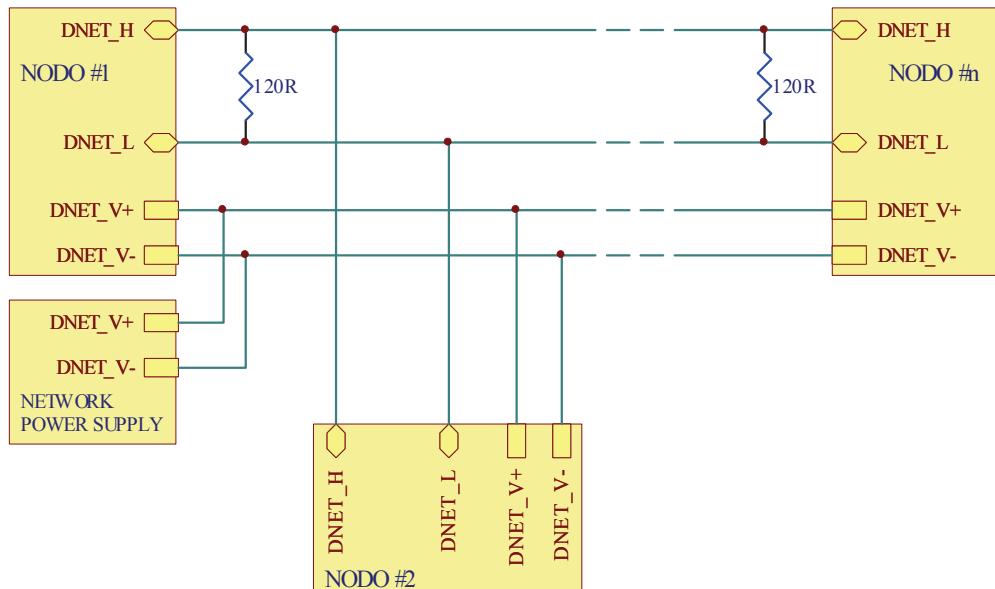
i GWC device could be equipped with up to 2 RS232/485 serial interfaces, depending upon specific device version.

RS232/RS485 physical interface is a 9 poles SUB-D type connector
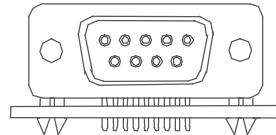
i Please refer to software manual for further information about how serial interfaces work.

Connection table

Segnali	Pin	Funzioni
n.c.	CN4(5).1	not connected
Rx	CN4(5).2	RS232 receiver input
Tx	CN4(5).3	RS232 transmitter output
n.c.	CN4(5).4	not connected
GND	CN4(5).5	RS232 Interface Signal ground
+Rx	CN4(5).6	RS485 receiver +side (input)
+Tx	CN4(5).7	RS485 transmitter +side (output)
-Rx	CN4(5).8	RS485 receiver –side (input)
-Tx	CN4(5).9	RS485 transmitter –side (output)

Wiring requirements Please use shielded cable having wires with 0.5mm^2 (#20AWG) or 0.25mm^2 (#23AWG) section. For the RS485 connection please use a cable having twisted pairs.

Connector pin-out

RS485 connection

Master

FULL DUPLEX MASTER/SLAVE BUS 4 Wires Net

Node... #1   Node... #2   Node... #n

Note: bus 1st and last nodes must have ending resistor inserted
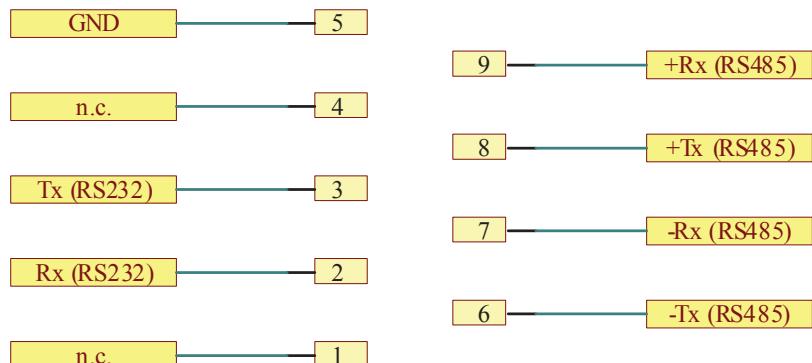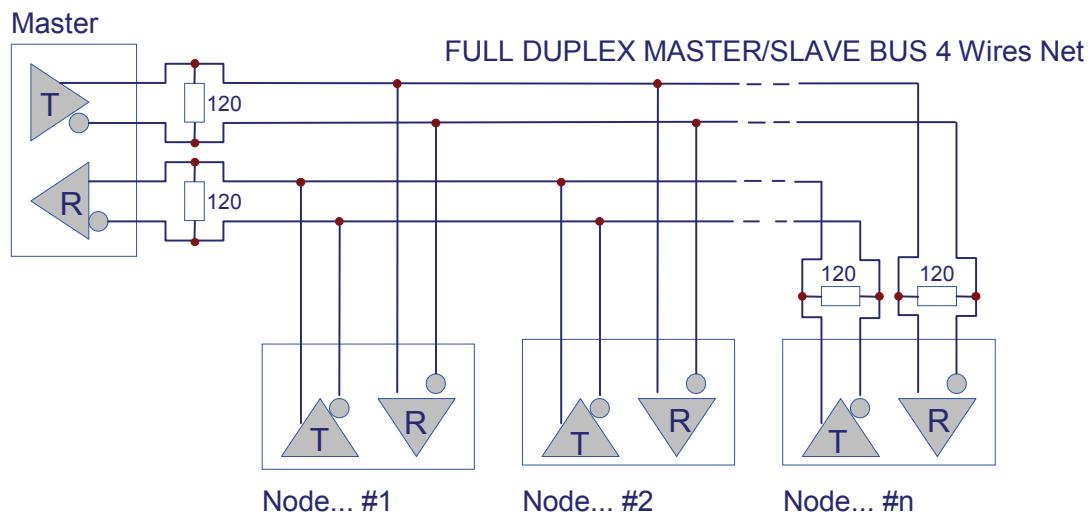
3.5.6. CN6: Digital inputs connection

There are 8 opto-isolated, 24Vdc, PNP/Push pull source compatible available on CN6 front connector.

CN6 is a PHOENIX micro-COMBICON 1881516 9-poles male connector

Connection table

Pin	Description	Function
CN6.1	IN-0	
CN6.2	IN-1	
CN6.3	IN-2	
CN6.4	IN-3	
CN6.5	IN-4	Input function depends upon user program running on the GWC device
CN6.6	IN-5	
CN6.7	IN-6	
CN6.8	IN-7	
CN6.9	VSS	Common Vss

Please refer to chapter 5 for further information about how to I/O work on different GWC device available versions.

Wiring requirements

Please use shielded cable having wires with 1.0mm^2 (#18AWG) or 0.5mm^2 (#20AWG) section.
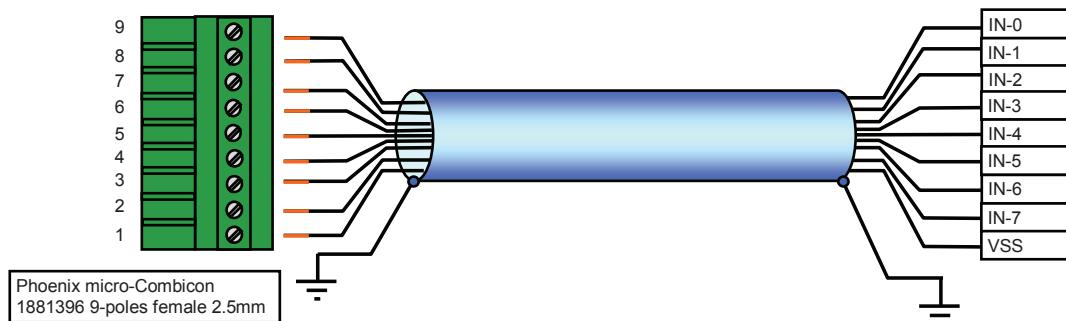
3.5.7. CN7: Digital outputs connection

There are 8 opto-isolated, 24Vdc, PNP available on CN7 front connector.

CN7 is a PHOENIX micro-COMBICON 1881529 10-poles male connector

Connection table

Pin	Description	Function
CN7.1	OUT-0	
CN7.2	OUT-1	
CN7.3	OUT-2	
CN7.4	OUT-3	Output function depends upon user
CN7.5	OUT-4	program running on the GWC device
CN7.6	OUT-5	
CN7.7	OUT-6	
CN7.8	OUT-7	
CN7.9	+24Vdc	Outputs power supply (+)
CN7.10	VSS	Common Vss (-)

i   Please refer to chapter 5 for further information about how to I/O work on different GWC device available versions.

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

Phoenix micro-Combicon 1881406
10-poles female 2.5mm
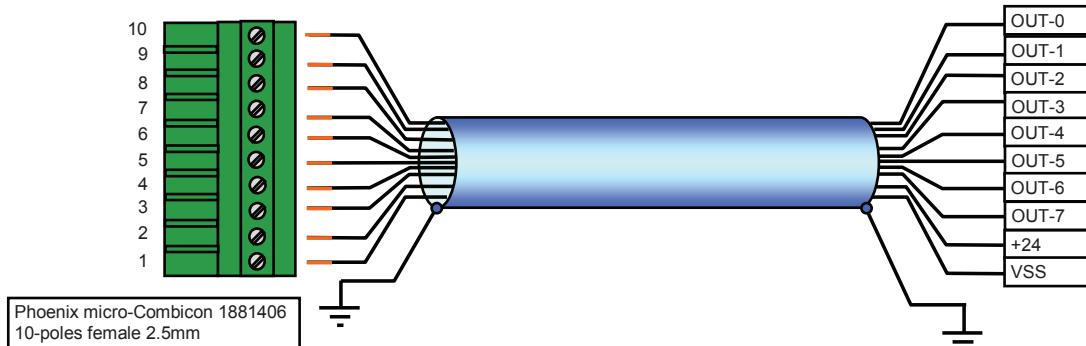
PROFIBUS DP interface is not available on all device versions.

PROFIBUS DP physical interface is a 9 poles female SUB-D type connector
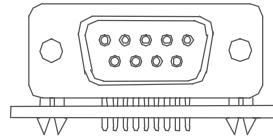
i   Please refer to software manual for further information about PROFIBUS connection.

Connection table

Segnali	Pin	Funzioni
Shield	CN8.1	Shield – Protective Ground
n.c.	CN8.2	n.c.
RxD/TxD-P	CN8.3	Positive Receive/Trasmission Data
CNTR-P	CN8.4	Control Signal for repeaters (Positive direction control – RTS)
DGND	CN8.5	Data Trasmission Ground
V+	CN8.6	Supply Voltage Positive (+5V for terminating resistors)
n.c.	CN8.7	n.c.
RxD/TxD-N	CN8.8	Negative Receive/Trasmission Data
CNTR-N	CN8.9	Control Signal for repeaters (Negative direction control – RTS)

Wiring requirements

Please use shielded cable having twisted pairs with 0.5mm^2 (#20AWG) or 0.25mm^2 (#23AWG) section.

Shield	1		6	V+	
n.c.	2		7	n.c.	
RxD/TxD-P	3		8	RxD/TxD-N	
CNTR-P	4		9	CNTR-N	
DGND	5				
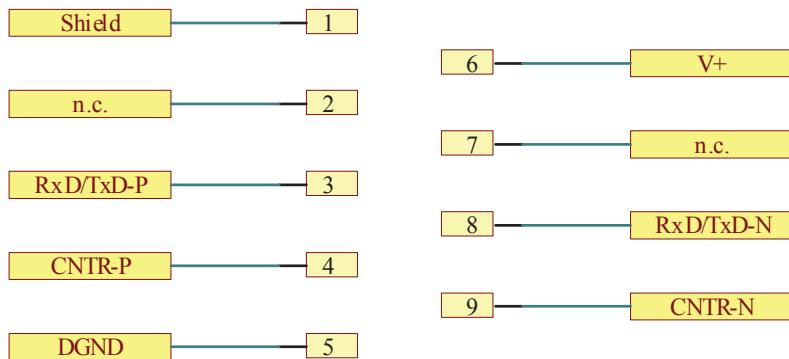
PROFIBUS network topology
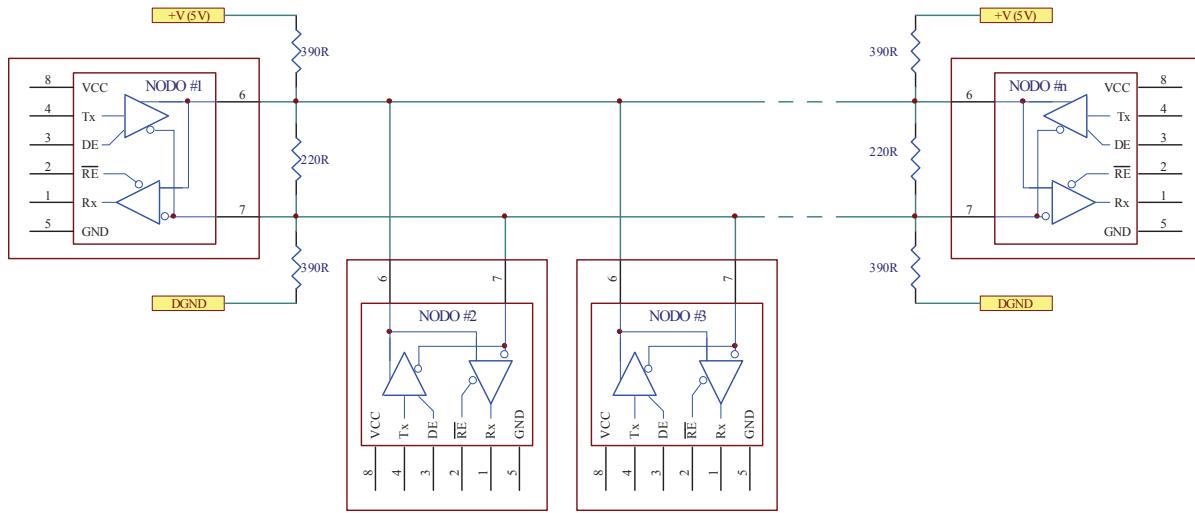
Note: the first and last node should have ending resistors inserted

3.5.9. CN12 CN13: TRASPONDERs connection

PROFIBUS DP interface is not available on all device versions.

Transponders physical interface is an AMP 3 poles MODU MTE 103635-2 connector
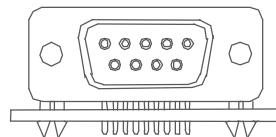
i Please refer to software manual for further information about Transponders connections.

Connection table

Pin	Description	Function
CN12(13).1	TRSP_TX	Data Trasmission
CN12(13).2	TRSP_RX	Data Receive
CN12(13).3	TRSP_GND	Trasponder GND

Wiring requirements Please use provided cable for transponders connection.

4. Controller start up

This section provides information on how to startup GWC controller.
User should:

- check the installation
- provide GWC controller maintenance.

4.1. Check the installation

Before starting it up

- Please check that GWC device version is the correct/desired one;
- Please check that controller setup satisfies software application requirements;
- Please check that wiring and mounting have been performed in the correct way.

4.2. Maintenance

GWC device is designed to reduce maintenance operations to the minimum, such as regular removal of dust from heat sinks by mean of filtered, dry and low pressure air flow.

4.3. Signals and working conditions

Signals

GWC device current state/operating condition is displayed by mean of a 7-segment display.

i

Please refer to software manual for the specific application signals meaning.

4.4.   Troubleshooting

Troubleshooting table

Simptoms	Consequent action
No effects are observed on the controller system.	Please check power supply wiring, fuse integrity and, if previous checks are ok, verify that power supply voltage is within allowed range and tolerances.
User program does not run	Please check wirings and power supplies. Please check software manual.
No data exchange on communication lines	Please check wirings and power supplies. Please check software manual.
Digital outputs do not work	Please check digital outputs wirings and power supplies. Please check software manual.
Data on digital inputs is not read properly	Please check digital input wirings, in particular the Vss signal cable. Please check software manual

Please use provided protection state diagram and troubleshooting table to locate the problem and solve it. If correct device operations are not restored, please contact TECNOLOGIX service department.

If not sure about GWC device operations, prior to replace it please check that installation and provided power supply are those needed for device correct operations.
Attempts to solve a problem by simply replacing the *supposed* faulty unit are not a good practice in troubleshooting.
When normal operation conditions have been restored, please start up the system (GWC device and controlled system) in order to avoid dangerous situations.
If it is not possible to solve the problem, please phone TECNOLOGIX for technical support or send an e-mail message including following information:

- GWC device version (GWCnnnn) and serial number, as printed on the label placed on the metal box;
- A full description of the problem, including working conditions in which the problem arose;
- Any information about GWC device setup, i.e. I/O connections, communication interfaces used and related network topology, if any, etc.)
- Nominal and measured power supply voltage and its characteristics (i.e. ripple);
- Any information about additional devices connected to GWC (data exchanged, connection diagram, etc.)

Return merchandise

To return a defective device to TECNOLOGIX for repair or replacing, please follow reported steps:

- Please put the device into its original packaging; TECNOLOGIX is not responsible for damages caused by an inadequate packaging or a not correct handling.
- Please, if possible, attach a complete description of the problem;
- Please ship the device to:

INPECO s.p.a.
VIA GIVOLETTO 15
VAL DELLA TORRE (TO)
10040   ITALY
Tel: +39 02 36681400
Fax: +39 02 36681499
info@inpeco.com
www.inpeco.com

TECNOLOGIX will quote the repair before any intervention; all shipping charges will be paid from the Customer.

5. GWC versions and specifications

This section describes characteristics of available GWC versions.

> **i** *Information provided in this section are considered priority than GWC general specifications previously reported.*

5.1. Device coding and order information

To order a GWC specific version, please use following information:

GWC _ _ _ _ _ _

- custom : 00 = none
- link: refer to table 4
- I/O: refer to table 3
- serial if: refer to table 2
- bus type: refer to table 1
- Product identifier : **G**ate**W**ay **C**ontroller
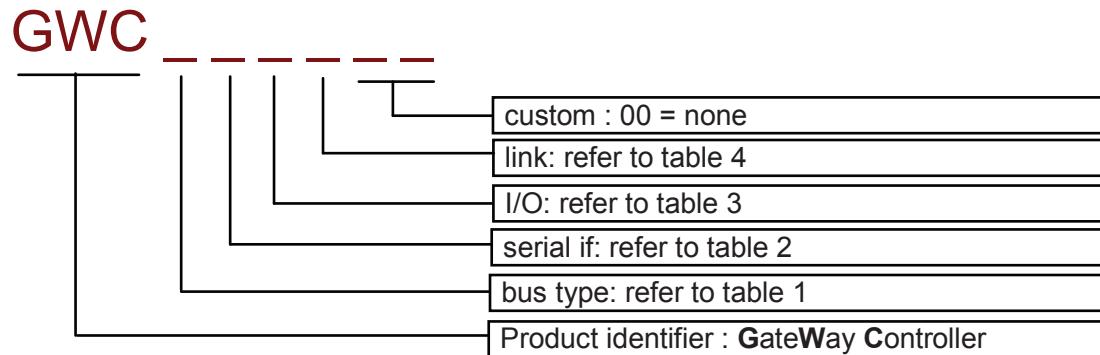
	Table 1 : BUS type
0	
1	CanOpen
2	DeviceNet
3	CanOpen+DeviceNet
4	CanOpen
5	2 CanOpen
6	Profibus+ 2 CanOpen
7	Profibus+CanOpen+DeviceNet
8	Profibus
9	Profibus+CanOpen
A	Profibus+DeviceNet

	Table 2 : SERIAL IF
0	none
1	1 RS232/485
2	2 RS232/485
3	1 RS232
4	2 RS232
5	1 RS485
6	2 RS485
7	1 RS232 + RS485
8	
9	
A	

	Table 3 : I/O
0	no I/O
1	8 DigIN + 8 DigOUT
2	(*) Encoder
3	(*) 8 DigI/O + Encoder
4	(*) Analog IN
5	(*) 8 DigI/O + Encoder + AnalogIN
6	(*) 8 DigI/O + Encoder + CLK Out
7	
8	(*) Uscite CLK
9	
A	(*) 8 DigI/O + Encoder + AnalogIN + CLK Out

(*) currently not available

5.2. Available GWCnnnn versions

GWC	Config	Power Supply	Digital Inputs (1)	Digital Outputs (1)	CAN	Device Net	Profi Bus	Serial	Trasponder	Kit conn.
B110	Cxxxx	24Vdc	8	8	1	1	1	2	--	C

Digital inputs: 24Vdc PNP
Digital outputs: 24Vdc@500mA PNP

5.3. Technical specifications

- **CISC 16bit 40MHz microprocessor, w/ 128KB internal flash memory;**
- **Up to 2MB external flash; default size is 1MB for versions with external flash on board;**
- **Up to 1MB hi-speed external RAM; default size is 1MB for versions with external RAM on board;**
- **Serial E^{2}PROM (optional);**
- **Up to 2 insulated 1MBit/s CANOpen interfaces;**
- **Up to 1 insulated 1Mbit/s DeviceNet interface (if present, only 1 CANOpen interface is available);**
- **2 insulated, half/full duplex independent serial RS232 or RS485 interfaces;**
- **8 insulated PNP inputs, 5V or 24V 200KHz; configuration 5/24V is performed at manufacturing time; IN0-IN1 could be driven by an incremental quadrature encoder;**
- **8 insulated, short circuit protected outputs, 24V 1KHz;**
- **8 dip switches handled by software;**
- **1 7-segment display handled by software;**
- **Power supply voltage: 24Vdc (±20%);**
- **Power supply maximum current: 800mA;**
- **Physical dimensions: 194(H) x 45(W) x 120(D) mm**
- **Weight: 380g (w/o metal box)**
  480g (w/ metal box)
  800g (w/ metal box and expansion board)
- **Operating temperature range: 0°C ÷ 50°C**
- **Storage temperature range: -25°C ÷ +55°C**
- **Humidity (non condensing): 5% ÷ 85%**
- **Maximum altitude: 1000m s.l.**
- **IP20 protection class**

A. APPENDIX

A.1   Connections

CN1   DC Input Supply + Earth Ground

Pin	Input	Description
CN1.1	V+	Power supply voltage DC (+)
CN1.2	V-	Reference for power supply voltage DC (-)
CN1.3	EARTH	Earth Ground

CN2   CanOpen #1

Pin	Signal	Function
CN2.1	0_CAN	Can_Ground
CN2.2	CAN_L	CAN_L signal
CN2.3	Earth	Can_ Shield
CN2.4	CAN_H	CAN_H signal
CN2.5	N.C.	N.C.

CN3   DeviceNet or CanOpen #2

Pin	Signal	Function
CN2.1	DNET_V-	DNET_Ground
CN2.2	DNET_L	DNET CAN_L signal
CN2.3	DNET_SHIELD	DNET_ Shield
CN2.4	DNET_H	DNET CAN_H signal
CN2.5	DNET_V+	DNET Positive Supply

CN4   RS232/485#1

Pin	Signal	Function
CN4.1	n.c.	Not connected
CN4.2	Rx	RS232 receiver input
CN4.3	Tx	RS232 transmitter output
CN4.4	n.c.	Not connected
CN4.5	GND	RS232 Interface Signal ground
CN4.6	+Rx	RS485 receiver +side (input)
CN4.7	+Tx	RS485 transmitter +side (output)
CN4.8	-Rx	RS485 receiver –side (input)
CN4.9	-Tx	RS485 transmitter –side (output)

CN5   RS232/485#2

Pin	Signal	Function
CN5.1	n.c.	Not connected
CN5.2	Rx	RS232 receiver input
CN5.3	Tx	RS232 transmitter output
CN5.4	n.c.	Not connected
CN5.5	GND	RS232 Interface Signal ground
CN5.6	+Rx	RS485 receiver +side (input)
CN5.7	+Tx	RS485 transmitter +side (output)
CN5.8	-Rx	RS485 receiver –side (input)
CN5.9	-Tx	RS485 transmitter –side (output)

CN6   Digital Inputs

Pin	Signal	Function
CN6.1	IN-0	
CN6.2	IN-1	
CN6.3	IN-2	
CN6.4	IN-3	
CN6.5	IN-4	Input function depends upon user program running on the GWC device
CN6.6	IN-5	
CN6.7	IN-6	
CN6.8	IN-7	
CN6.9	VSS	Common Vss

CN7   Digital Outputs

Pin	Signal	Function
CN7.1	OUT-0	
CN7.2	OUT-1	
CN7.3	OUT-2	
CN7.4	OUT-3	
CN7.5	OUT-4	Output function depends upon user program running on the GWC device
CN7.6	OUT-5	
CN7.7	OUT-6	
CN7.8	OUT-7	
CN7.9	+24Vdc	Outputs power supply 24Vdc
CN7.10	VSS	Common Vss (-)

CN8 ProfiBus

Pin	Signal	Function
CN8.1	Shield	Shield – Protective Ground
CN8.2	n.c.	n.c.
CN8.3	RxD/TxD-P	Positive Receive/Transmission Data
CN8.4	CNTR-P	Control Signal for repeaters (Positive direction control – RTS)
CN8.5	DGND	Data Transmission Ground
CN8.6	V+	Supply Voltage Positive (+5V for terminating resistors)
CN8.7	n.c.	n.c.
CN8.8	RxD/TxD-N	Negative Receive/Transmission Data
CN8.9	CNTR-N	Control Signal for repeaters (Negative direction control – RTS)

CN12 Trasponder#1

Pin	Signal	Function
CN12.1	TRSP_TX	Data Transmission
CN12.2	TRSP_RX	Data Receive
CN12.3	TRSP_GND	Transponder GND

CN13 Trasponder#2

Pin	Signal	Function
CN13.1	TRSP_TX	Data Transmission
CN13.2	TRSP_RX	Data Receive
CN13.3	TRSP_GND	Transponder GND

(*) Connector presence depends upon device specific version

A.2   Power supply

Connection diagram
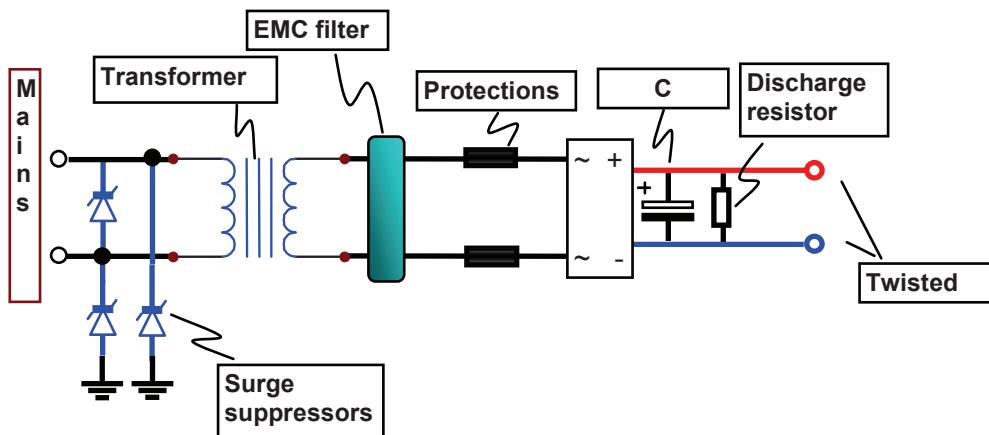
Surge suppressors   On transformer primary circuit, they protect device from mains surge.

Transformer   Transformer primary circuit have to be chosen according to mains characteristics. Voltage peaks on secondary are equals to

$$V_{2\text{-}RMS} \cdot \sqrt{2}$$

where $V_{2\text{-}RMS}$ is transformer secondary circuit nominal voltage

Power supply characteristics depend upon loads connected to DC line.

Approx. characteristics can be obtained applying the following procedure:

- Overall power consumption P_{tot} (Watt):
  $P_{tot} = \sum P_L$
  Where P_L is a connected load power consumption in Watt.
- Transformer power P_{Tr} (Watt):
  $P_{Tr} = 2 \cdot P_{tot}$
- Transformer power P_{TrVA} (VA):
  $P_{TrVA} = P_{Tr} / 0.7$ (1 ph.)
  $P_{TrVA} = P_{Tr} / 0.8$ (3 ph.)
- Let consider a voltage fall equals to 8% of nominal voltage on load connection, then:
  $P_{TrVA} = V_{dcBUS} \cdot I_{max} \cdot \sqrt{2}$

AC/DC converter (requirements to power a GWCnnnn w/ expansion board) :

Rectifiers	Let consider 800mA as maximum nominal current
C	2200uF (85°C) w/ 1ph mains 1000uF (85°C) w/ 3ph mains Capacitors working voltage have to be greater than V_{DC} maximum value plus a safety zone, then it will be 35V
EMC filter	It is necessary to be compliant with EMC requirements; an EMC filter is recommended in presence of sensible circuitry powered by AC line. When using a commercial, please consider the overall RMS current of driven load. EMC filter should be inserted between mains and transformer in case the transformer is nearby the load; in all other cases the filter should be inserted between transformer and rectifiers, paying attention to keep its connection to the transformer as short as possible. Please refer to filter installation instructions for further details.
Protections	Please use 1A delayed fuses or an equivalent safety switch
FCC	Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment
Industry Canada	This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement CAN ICES-3 (A)/NMB-3(A)