DD2050 INDICATOR
USE AND MAINTENANCE MANUAL

CE

Code 81320402 Edition 13.12.2012

1. GENERAL

1.2 Foreword

- The aim of this manual is to provide the operator, through the use of text and illustrations, with essential information regarding the installation, safe operation and maintenance of the weighing system.
- This manual must be kept in a safe place where it is readily available for consultation. Always observe the instructions contained in the manual!
- The safe operation of the system is the responsibility of the operator, who must have a thorough knowledge of the system.
- The user is responsible for ensuring that the installation complies with the applicable regulations.
- The equipment must be installed by specialised personnel who have read and understood this manual.
- **"Specialised personnel"** means any personnel who, by virtue of the training they have received and their professional experience, have been explicitly authorised by the "System safety supervisor" to install, operate and maintain the system.
- In the event of any problems, contact your nearest Service Centre.
- Any attempt on the part of unauthorised personnel to dismantle or modify the terminal is prohibited; any such attempt shall invalidate the warranty and release the manufacturer from all liability for any injury or damage.
- The alteration or removal of the data plates and seals is strictly prohibited; check that all plates and seals are present and legible, if not contact After-Sales Service.
- Manufacturer shall not be liable for any damages caused by incorrect handling of the terminal.
- The information and illustrations contained in this manual were up to date at the time of publication.
- The Manufacturer is committed to a policy of continuous product improvement and system components may therefore be subject to modification.
- All the technical information contained in this manual remains the exclusive property of the manufacturer and may not be divulged to third parties.
- No part of this document may be reproduced or transmitted in any form, including publication in computerised form or on the World Wide Web, without the express written permission of the manufacturer.
- This manual may not be used for purposes other than those directly related to the installation, operation and maintenance of the terminal.

- In order to more clearly illustrate certain maintenance or adjustment operations, some of the illustrations in this manual show the weighing system with the safety guards removed. Under no circumstances may the system be operated in these conditions. Do not operate the system in these conditions under any circumstances whatsoever, but remove the safety guards for the time strictly required to carry out the required repairs or maintenance then fit them back in place.

1.3 SYMBOLS

Below is a list of the symbols used in this manual to alert the reader to the various hazards associated with the operation and maintenance of the instrument.

DANGER

Denotes an operation or procedure where failure to observe the instructions will result in death or serious injury.

CAUTION

Denotes an operation or procedure where failure to observe the instructions could result in minor injury or damage to the instrument.

WARNING

Information or instructions on how the system is to be operated correctly in order to maximise its service life or prevent loss or damage of programmed data or to optimise operation with regard to metrological standards.

1.4 DESCRIPTION OF THE TERMINAL

The digital weight indicator allows highly accurate and reliable weighing. It is mainly designed to weigh vehicles and for commercial weighing purposes. The graphic display and fully alphanumeric keypad make it ideal for use by even inexpert operators.
Some of the main features of the indicator and listed below:

- facility for connection to a maximum of 2 scales with analogue load cells (up to 24 x 350 ohm load cells)
- facility for connection to a maximum of 2 scales with digital load cells (up to 16 CPD load cells)
- three RS232/422 serial ports
- 2 inputs and 2 outputs
- 110-240 VAC power supply
- can be connected to the keyboard of a compatible external PC

Optional boards to interface the indicator and expand the system can be added on request.

1.5 TECHNICAL CHARACTERISTICS OF THE TERMINAL

Power Supply	110-240 Vac 200W
Load cell connection	up to 12 x 350 ohm analogue load cells via 9-pin connector per scale input
	up to 12 x CPD digital load cells via 15-pin connector for 1 scale input (up to 8 load cells per input in the event of a duplex)
Minimum impedance	29 ohm (for each analog scale)
Analog load cells excitation	10 Vdc
Digital load cells excitation	10 – 18 Vdc
Internal resolution	500000 counts @ 25 conv/sec
	120000 counts @ 100 conv/sec
Resolution in type-approved version:	6000 divisions maximum
Maximum input signal	23 mV
Sensitivity	0.6 uV/division (version with analogue load cells)
Full scale stability	< 5 ppm/°C
Zero stability	< 5 ppm/°C
Compensated temperature range	-10 + 40 °C
Operating temperature range	-15 + 50 °C
Protection class	Able to withstand inclement weather conditions with the

	supplied cover
Humidity	85% @ 40 °C
Output maximum voltage	24 VAC/DC
Output maximum current	190 mA max
External keyboard input	USB
Display	12.1” TFT colour display
Touch screen	Resistive/ Capacitive Sunlight version
Printer (optional)	Thermal type 80mm media
Reader (optional)	RFID, Barcode, magnetic according to the model

1.6 DIMENSIONS AND WEIGHT

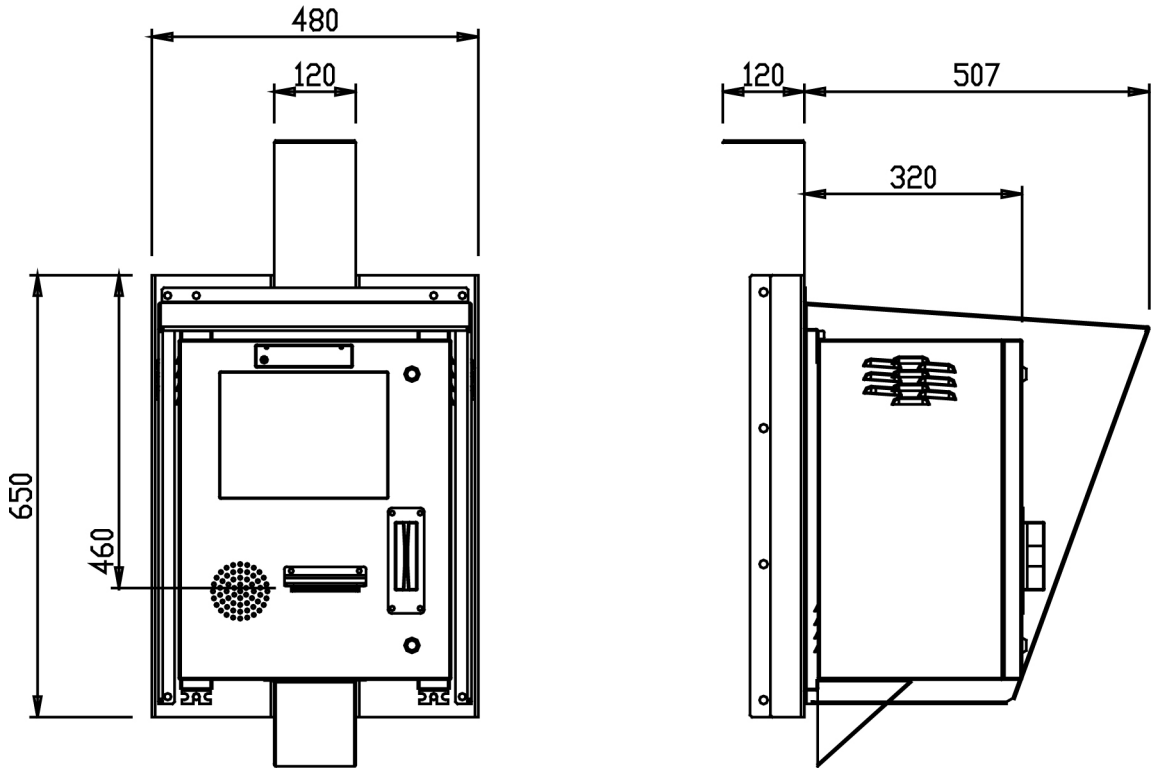


Fig 1.1 – Overall dimensions and weight of the wall-mounted terminal version

Dimensions in mm
Weight: 23 kg

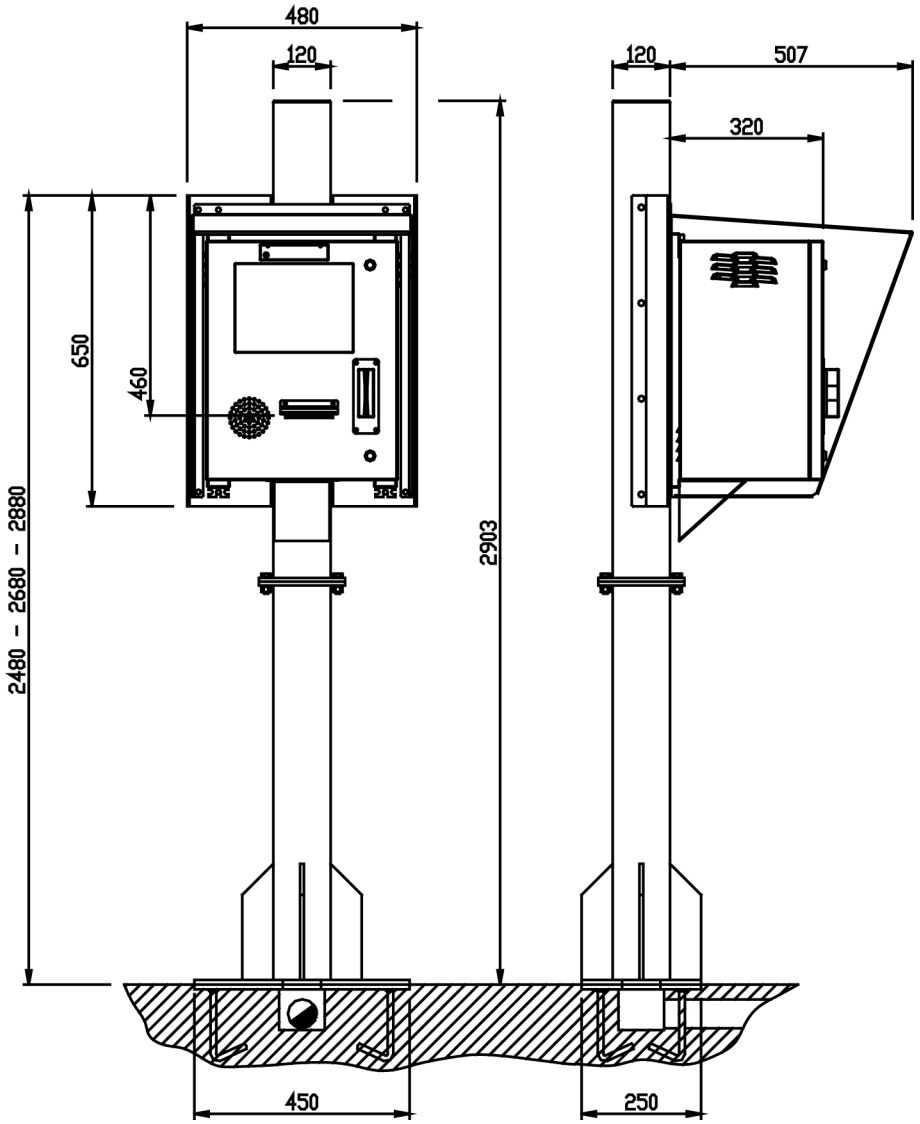
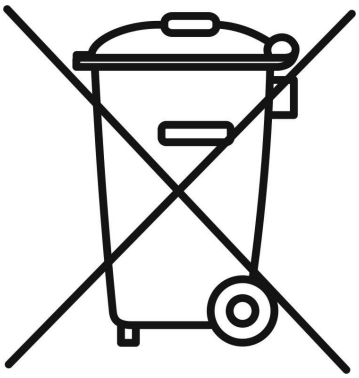


Fig 1.2 – Overall dimensions and weight of the pedestal terminal version

Dimensions in mm
Weight: 23 kg

1.7 DISPOSAL



This electrical or electronic device cannot be disposed of as solid urban waste.
It must be disposed of separately

1.8 TECHNICAL ASSISTANCE

In the event of any operating faults requiring the intervention of specialised technicians, contact the manufacturer or your nearest Service Centre. To enable us to deal with your request swiftly, always quote the serial number of your terminal, which can be found on the seal label. Also provide information about the system in which the terminal is installed.

1.9 SPARE PART LIST

CODE	DESCRIPTION
28200148	THERMAL PAPER ROLL LENGTH = 155 m WIDTH= 80 mm EXTERNAL DIAMETER = 130 mm INTERNAL DIAMETER = 25 mm

1.10 WARRANTY

The conditions of warranty are stipulated in the contract of sale.

2. SAFETY INSTRUCTIONS

2.1 PROHIBITED USES

The instrument you have purchased is a weighing system and has been designed and manufactured as such. The instrument is primarily intended for the weighing of goods.

- ✓ It is forbidden to use the terminal without taking the necessary precautions for safe use.
- ✓ Use of the terminal in places with potentially explosive atmospheres or in areas where there is a risk of fire is strictly prohibited.

Any other use shall only be permitted if expressly authorised by the Manufacturer.

2.2 REGULATIONS

The operating conditions for the electronic terminal are subject to the regulations in force in the country in which the terminal is used. All use of the terminal in conditions which do not comply with these regulations is prohibited.

2.3 PRESCRIPTIONS OF USE

- ✓ Strictly comply with the instructions in this manual during use. In the event of any discrepancy between the information in this manual and the instrument purchased, contact your Dealer or the Manufacturer's After-Sales Service for clarification.
- ✓ Always observe the indications given on the warning and danger plates on the terminal.
- ✓ Check that all the safety guards are in place and that the connection cables are in good condition and connected correctly.

- ✓ Check that the terminal is connected to an electrical outlet socket equipped with an effective earth connection. Make sure that the line complies with the applicable regulations. Check that there is no difference in potential between the earth and neutral conductors.
- ✓ If the terminal is to be connected to other devices (e.g. a computer), these devices must be disconnected from the electrical supply before connection to the terminal.

3. INSTALLATION

Fig. 3A INTERNAL

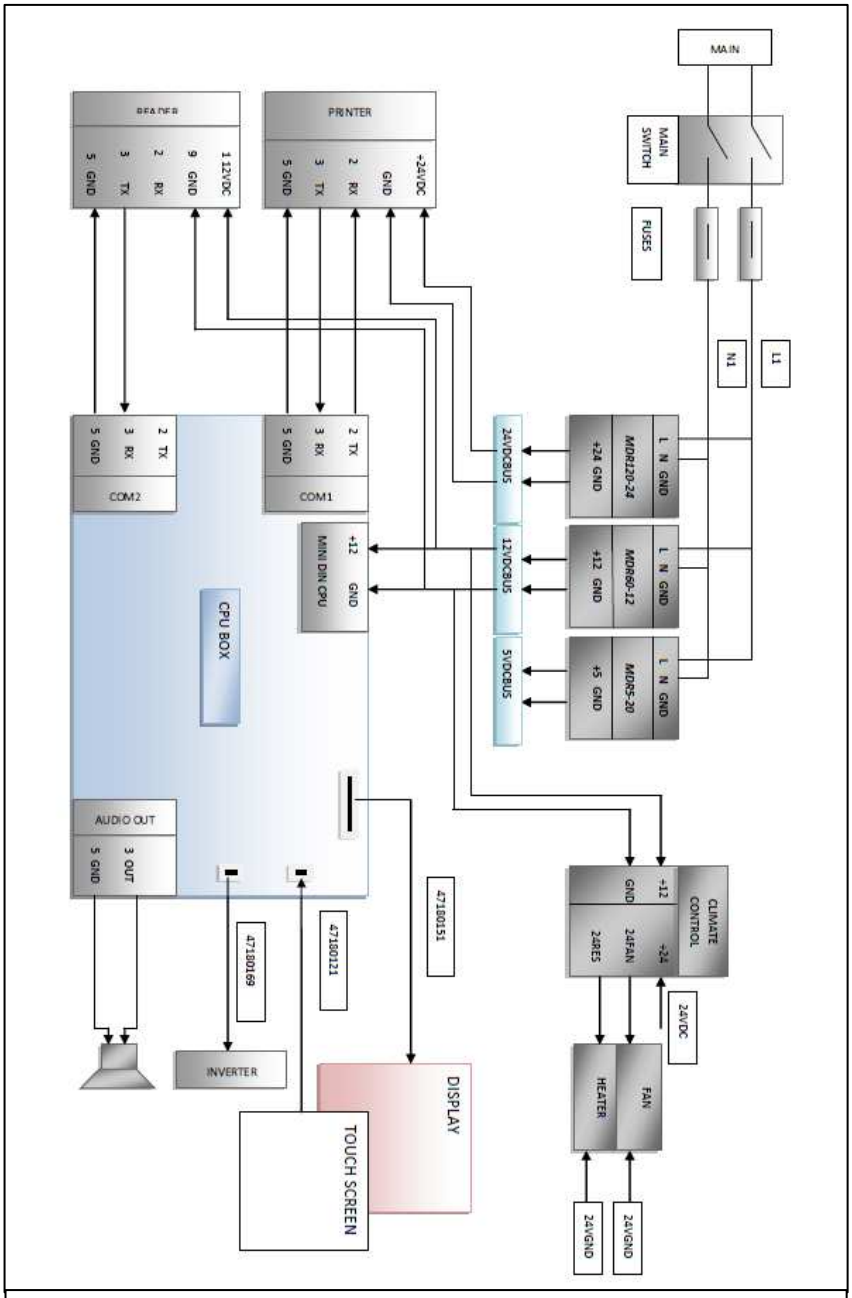


Fig. 3B: Block diagram

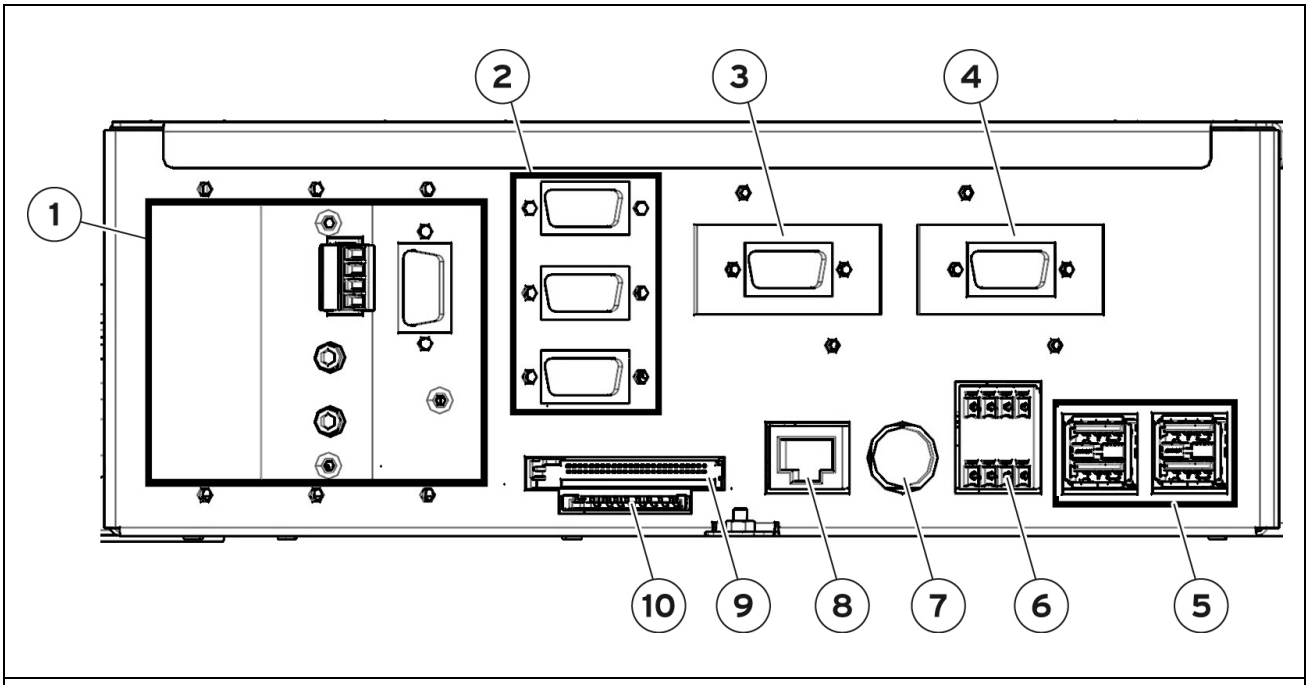


Fig 3.1 – CPU box: bottom view

Key:

1. Optional board slots
2. N° 3 serial com ports RS232/422
3. Scale A
4. Scale B
5. USB Host.
6. N° 2 input/output 24 V ac/dc.
7. 12 Vdc/5A power entry
8. Ethernet 10/100 Mbps
9. Compact flash
10. SD card

3.1 CONNECTION OF THE TERMINAL TO THE ELECTRICAL SUPPLY LINE

Connection to the electrical supply line is at the customer's charge. The customer must arrange for specialised electricians to route the protection conductor and power lead.

3.1.1 Earth connection

Connect the terminal to the earth network using a yellow-green lead of at least 6mm². Use the earth connection screw under the terminal.
The equipotential connector from the scale (if any) should also be connected to the same earth connection point (see *par. 3.3.1 on page 1-25*).
If the terminal is installed on a pedestal, insert the earth lead into this.
The leads and accessories for this connection are not part of the supply but are at the customer's charge.

3.1.2 Connection to main

Use a three pole lead with a section that suits the type of installation.
Refer to the technical specifications of the power supply line when choosing the power lead

Main characteristics of the power lead:

- ✓ cable with double insulation and 3 coloured internal conductors (line=brown, neutral=blue, earth=yellow-green)
- ✓ internal conductors with section from 1,5mm² to 2,5mm²
- ✓ outer sheath diameter from 5 to 10mm

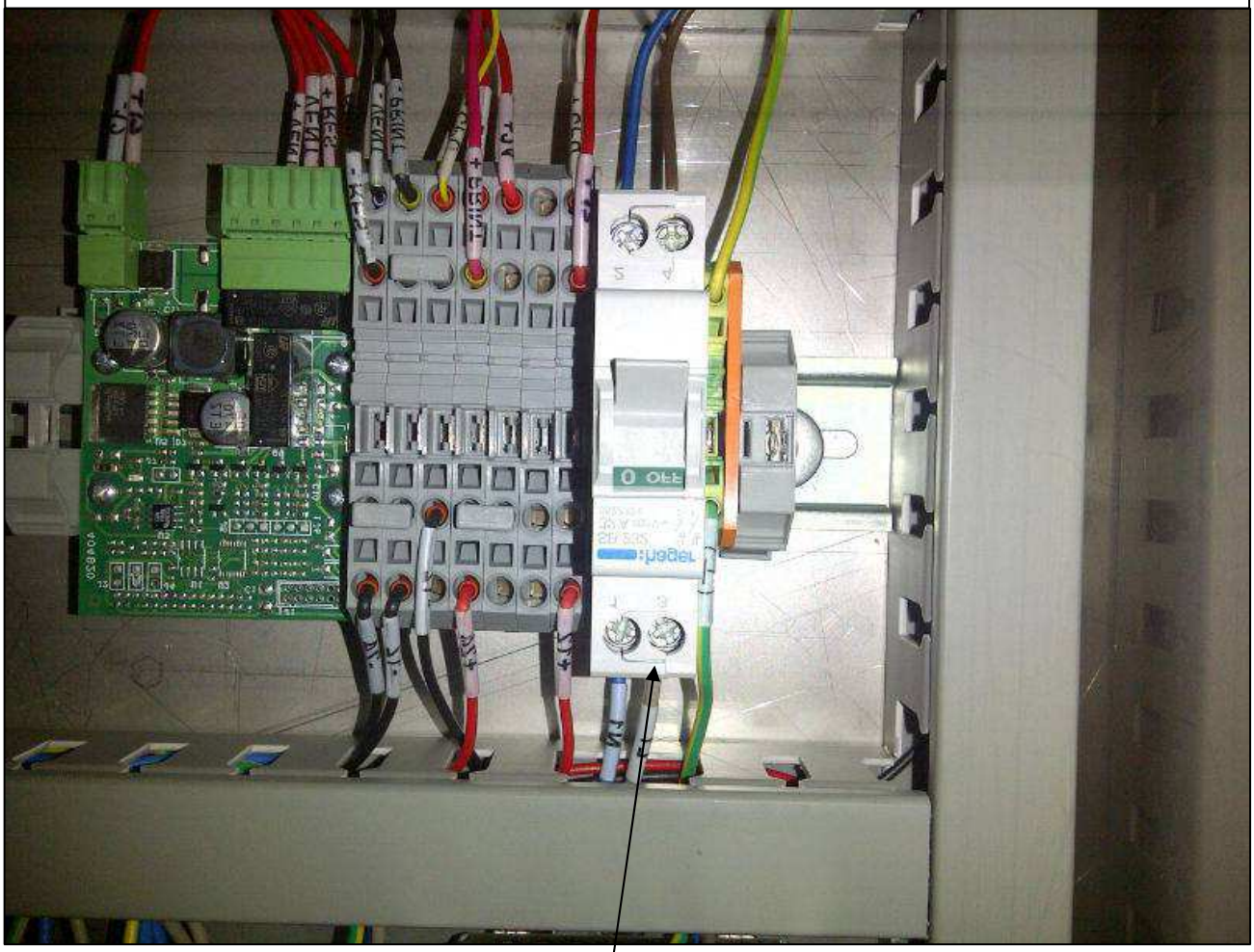
DANGER

Check that:

- ✓ *the voltage and frequency of the electrical supply line correspond to the indications on the sealing plate on the bottom of the terminal;*
- ✓ *the mains outlet socket to which the terminal is connected is equipped with an earth;*
- ✓ *the warning and danger signs are present and legible;*
- ✓ *failing this, notify your maintenance personnel or contact our Assistance Service directly*

Use the main internal switch to connect the main power supply according to the figure below

Fig. 3.1.2 Connection to the mains



Connection to mains

CAUTION

The terminal complies with the European Directive for electromagnetic compatibility, however it is good practice to provide a separate power supply line for the terminal.
The power supply line must take a separate route from the signal leads (RS232,422, Ethernet, load cell lead).
Do not route the terminal connection cables alongside power cables as these could cause disturbances that interfere with the correct operation of the terminal.

3.2 Connection to scale

3.2.1 Equipotentiality between the terminal and the platform scale

Check that a condition of equipotentiality exists between the metal parts of the terminal and the platform scale.
If in doubt, connect the terminal and the scale using a earth wire of at least 6mm² using the earth screw on the rear of the terminal.
The cables required for this connection are to be provided by the customer.

3.2.2 Scale connection. Analogue load cells

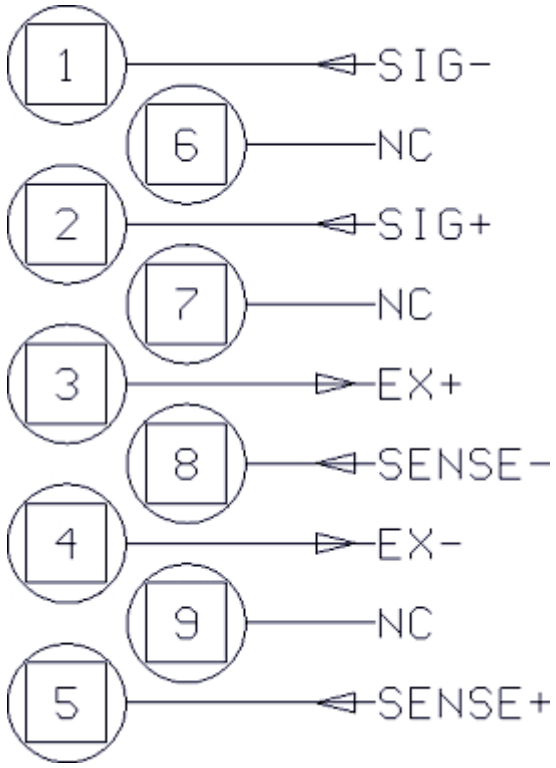


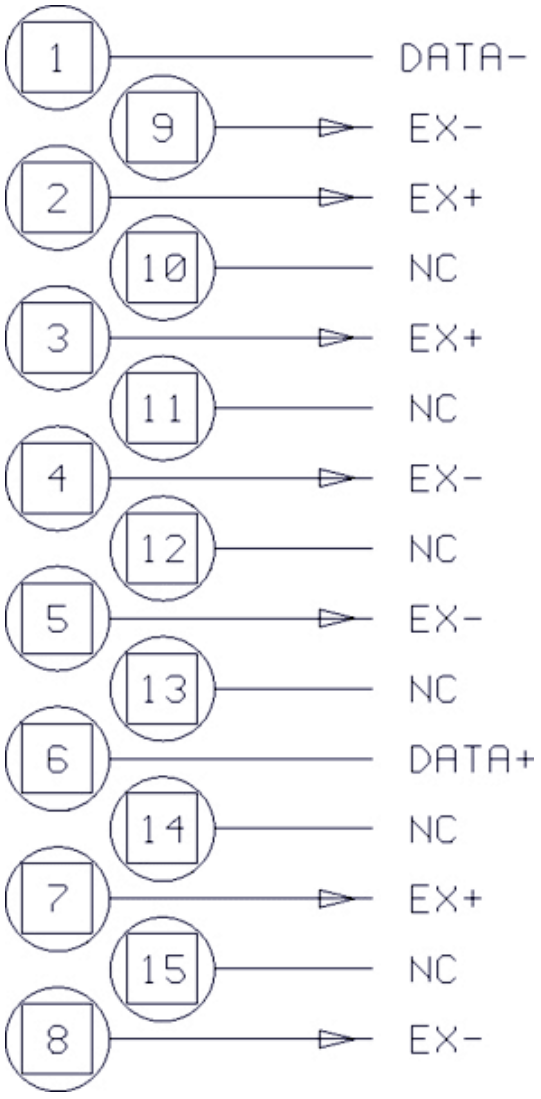
Fig 3.2.2 – JBIL connection diagram for analogue load cells

Key:

NC = Reserved, do not connect
SIG + = Load cell signal +
SIG - = Load cell signal --
EX + = Load cell excitation +
EX - = Load cell excitation --
SENSE + = SENSE + signal
SENSE - = SENSE - signal

3.2.3 Scale connection: digital load cells

Communications between indicator and digital load cells is supported by an RS485 protocol on a 6 wires shielded cable according to the following drawing.



Key:
EX + = Excitation +
EX - = Excitation -
DATA +/- = Bidirectional data lines
NC = Reserved, do not connect

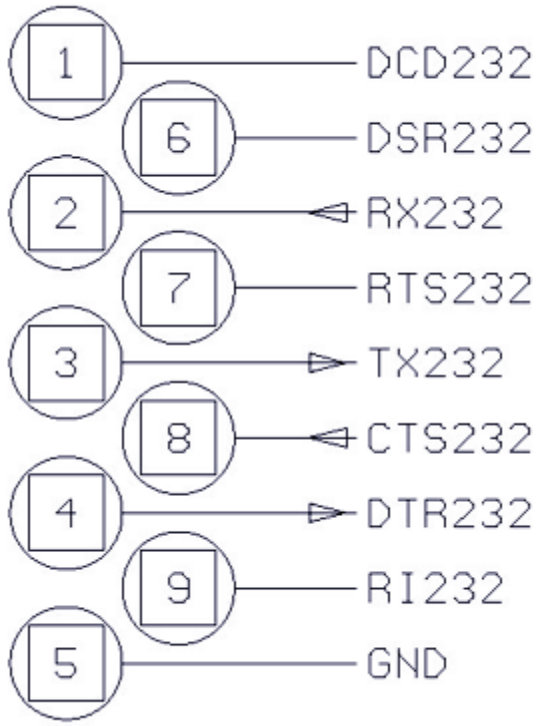
Fig 3.3 – JBIL connection diagram for digital load cells

3.3 SERIAL OUTPUTS

There are 3 serial outputs in the standard configuration; they are normally assigned as follow

- COM 1 is connected to the internal reader
- COM 2 is connected to the internal printer
- COM 3 is available for additional peripheral devices (remote display, additional readers.)
Further serial outputs can be available on additional option boards

3.4 COM1 CONNECTION



Key:
DCD232 = Data Carrier Detect
DSR232 = Data Set Ready
RX232 = Received data
RTS232 = Request to send
TX232 = Transmitted data
CTS232 = Clear to send
DTR232 = Data terminal Ready
RI232 = Ring Indicator
GND = GND

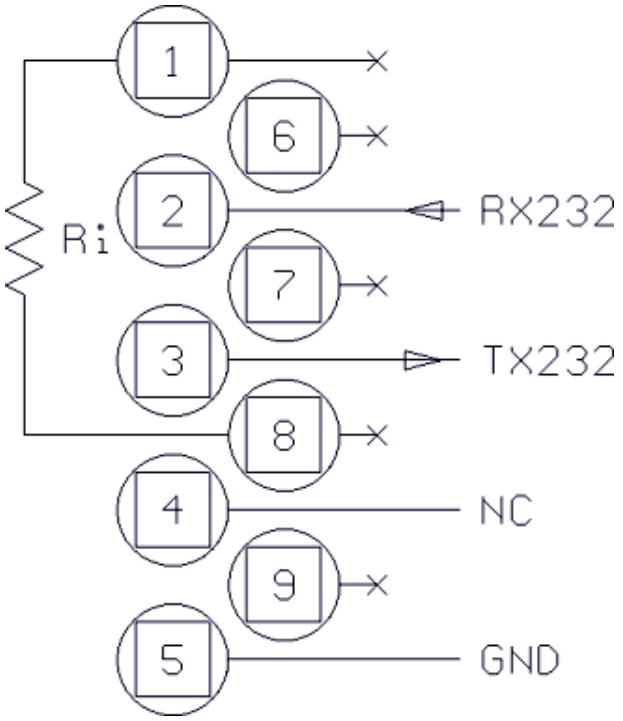
Fig 3.4 – COM! connection diagram (9 pole sub D)

CAUTION
Operating limits stipulated by the standard RS232:
Maximum transmission distance = 15 m
Maximum line voltage = ± 12 VDC
For connection to external devices, use a screened cable and connect the screen to the metal cap of the 9-pin connector.

3.5 COM2 CONNECTION

COM2 can be configured for RS232 data transmission standards on 9-pin female connector

3.5.1 RS232 CONNECTION



Key:

NC = Reserved, do not connect

RX232 = Received data

TX232 = Transmitted data

GND = GND

Ri = Termination resistance inside terminal

Figura 3.5 – COM2 serial port connector (9-pin female D-type)

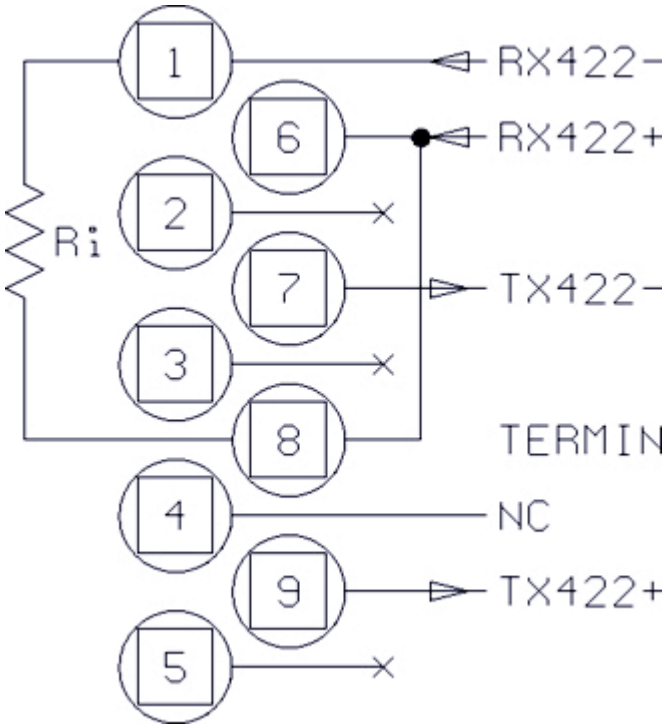
CAUTION

The RS232 operating limits are indicated in par 3.4

3.6 CONNECTION OF COM3 SERIAL OUTPUT

The standard instrument features a third serial output (COM3). For information about RS232 connection, refer to § 3.5. Pin coding is the same.

3.6.1 RS422 CONNECTION



Key:
NC = Reserved - do not connect
RX422 +/- = Received data
TX422 +/- = Transmitted data
TERMIN = Termination resistor to be connected to pin 6
Ri = Termination resistor inside terminal
NOTE: the free pins are reserved for RS232 connection

Figura 3.6 – Example of RS422 serial port connection

CAUTION
Operating limits stipulated by the standard RS422:
Maximum transmission distance = 1200 m
Maximum line voltage = +/- 7V
For connection to external devices, use a screened twisted pair cable and connect the screen to the metal cap of the 9-pin connector.

3.7 CONNECTION TO AN EXTERNAL KEYBOARD

The KBD connector features an input for connection of a keyboard of a compatible PC.

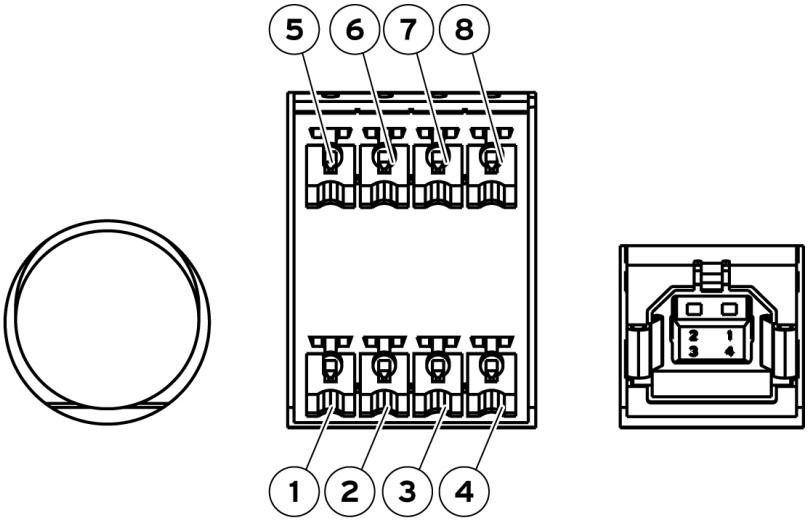
ATTENTION
Installation of an external keyboard disables operation of COM2.

3.8 INPUT/OUTPUT CONNECTION

The JI/O terminal board features input and output contacts; the following figure illustrates the connection diagram.

3.8 INPUT/OUTPUT

Input and output signals are provided on JI/O terminals according to the following diagram



Key:

1. PIN 1.
2. PIN 2.
3. PIN 3.
4. PIN 4.
5. PIN 5.
6. PIN 6.
7. PIN 7.
8. PIN 8.

Fig 3.8 – Input/Output pins

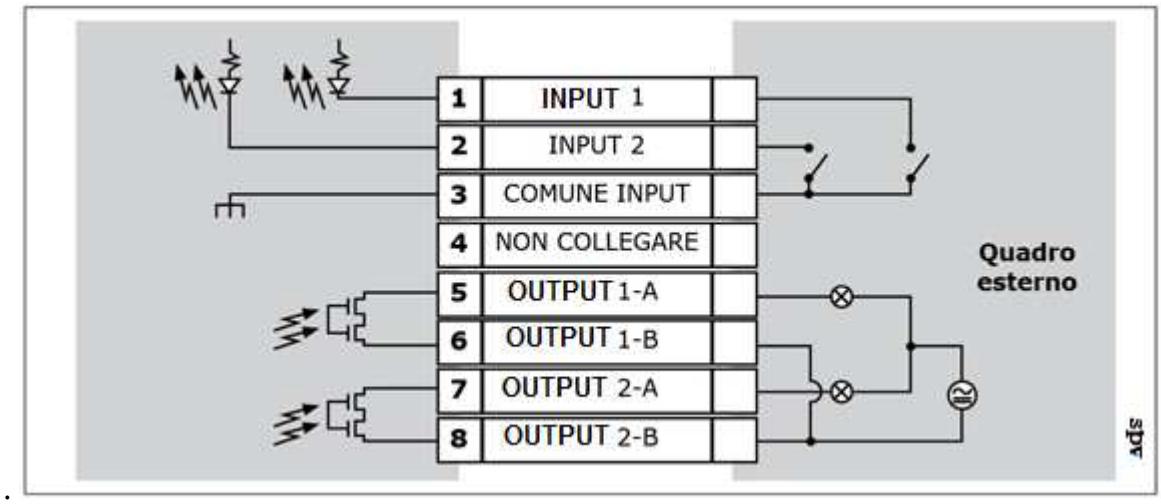


Fig 3.9 – I/O terminals– wiring example

Input connection

CAUTION

Electrical specifications

Inputs: maximum voltage ≤ 5 VDC

maximum current ≤ 5 mA

The inputs can be controlled by clean contacts or by NPN transistors (negative common connection).

Output connection

CAUTION

Electrical specifications

Outputs: switchable voltage ≤ 24 V (ac/dc)

switchable current ≤ 190 mA (ac/dc)

solid state contact (OPTOMOS)

3.9 OPTIONAL SERIAL OUTPUT

In case of an additional serial board is installed in the indicator the connections are according the following drawings

COM5 serial connection

DSUB9 9-pin female connector.

PIN	DESCRIPTION
1	RX422 -
2	RX232
3	TX232
4	NC
5	GND
6	RX422 +
7	TX422 -
8	TERMINATOR
9	TX422 +

NC = do not connect

ATTENTION

Max. conditions of usage under RS232 standard:

Max. transmission distance: 15 m

Maximum voltage at ends: ± 12 VDC

For connection to external devices, it is recommended to use a shielded cable, making sure to connect the shield to the metal part of the 9-pin connector's casing.

- If the COM5 serial port is configured in compliance with the RS422 standard, proceed as follows: provide a jumper between pin 6 and pin 8 to connect the termination resistor.

ATTENTION

Max. conditions of usage under RS422 standard:

Max. transmission distance: 1200 m

Maximum voltage at ends: +/- 7V

For connection to external devices, it is recommended to use a twisted pair, making sure to connect the shield to the metal part of the 9-pin connector's casing.

COM4 serial connection

6-pin spring terminal board

PIN	DESCRIPTION
1	Rx422-
2	Rx422+
3	Tx422-
4	Tx422+
5	TERMINATOR
6	GND

- If the COM4 serial port is configured in compliance with the RS422 standard, proceed as follows: provide a jumper between pin 2 and pin 5 to connect the termination resistor.

ATTENTION

Max. conditions of usage under RS422 standard:

Max. transmission distance: 1200 m

Maximum voltage at ends: +/- 7V

For connection to external devices, it is recommended to use a twisted pair, making sure to connect the shield to the metal part of the 9-pin connector's casing.

RS485 connection on DSUB9 connector

If the COM5 serial port is configured in compliance with the RS485 standard, proceed as follows:

Connect pins 9 and 6 (DATA +) pins 1 and 7 (DATA -) together.

Provide a jumper between pin 6 and pin 8 to connect the termination resistor; this operation must be performed on the first and last of the devices connected together.

RS485 connection on terminal board

If the COM4 serial port is configured in compliance with the RS485 standard, proceed as follows:

Connect pins 2 and 4 (DATA +) pins 1 and 3 (DATA -) together

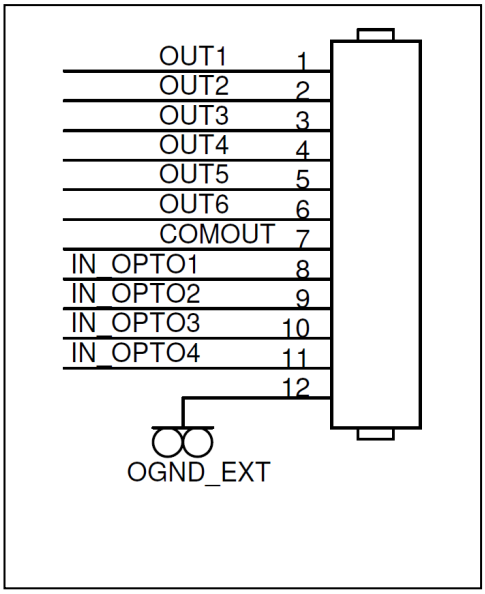
Provide a jumper between pin 2 and pin 5 to connect the termination resistor; this operation must be performed on the first and last of the devices connected together.

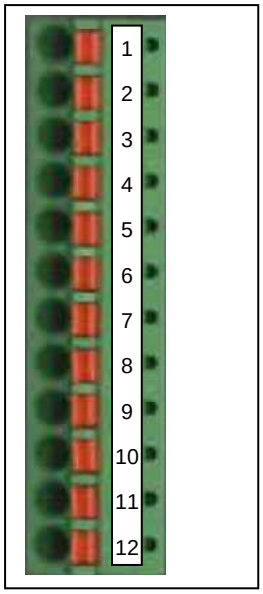
ATTENTION

Max. conditions of usage under RS485 standard:
Maximum transmission distance = 1200 m
Maximum voltage at ends = ± 7V
It is advisable to use a shielded cable of the "twisted pair" type for connections to external devices. Remember to connect the shield to the metal part of the shell of the 9-pin connector.
Maximum number of terminals that can be connected = 16

3.10 OPTIONAL 4INPUT/ 6OUTPUT

In case of an additional input/output card is installed in the indicator the connections are according the following drawings:





Input connection

CAUTION

Electrical specifications

Inputs: maximum voltage ≤ 5 Vdc

maximum current ≤ 5 mA

The inputs can be controlled by clean contacts or by NPN transistors (negative common connection).

Output connection

CAUTION

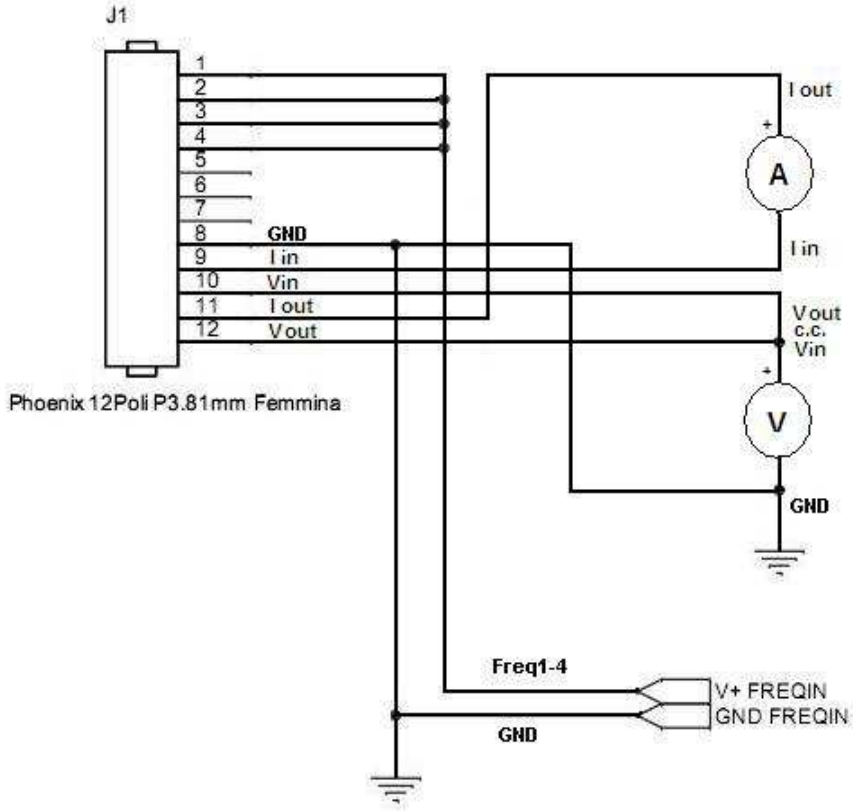
Electrical specifications

Outputs: switchable voltage ≤ 24 V (ac/dc)

switchable current ≤ 190 mA (ac/dc)

solid state contact (OPTOMOS)

3.11 OPTIONAL Analog Output (0-10v, 4-20mA)



The card provides 0-10 V or 0(4mA)-20 mA galvanically separated by an analogue output ; the connection pinout is given in the following table:

Analogue current output:
Set the jumper J14 to position 2-3 for current output 4-20mA, on the pins : 11 (Current Out) and 9 (Current In)
Analogue voltage output:
Set the jumper J14 to position 1-2 for voltage output 0-10V on the pins : 12 Voltage Out and 8 (GND)

CAUTION

Technical characteristics:
Resolution= 10000 points
Precision = 0.05 % FS
Minimum voltage output load = 100 kohm
Minimum current output load = 250 ohm

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