

## INTRODUCTION

The use of these devices has turned - IN EXCLUSIVE WAY - to specialized personnel.

The purpose of this handbook is to give the necessary information to the cognizant and sure use of the products. They are the result of a continual and systematic elaboration of data and technical tests saved and validated from the manufacturer, related to the inside modes of certainty and quality of the information.

The reported data are destined- IN EXCLUSIVE WAY- to specialized users, that can interact with the devices in safety conditions for the persons, for the machine and for the enviroment, impersonating an elementary diagnostic of breakdowns and of malfunction conditions by performing simple functional verify operations , in the height respect of the actual safety and health norms.

The informations for the installation, the assemblage, the dismantlement, the handling, the adjustment, the reparation and the contingent accessories, devices etc. installation are destined - and then executable - always and in exclusive way from specialized warned and educated personnel, or directly from the TECHNICAL AUTHORIZED ASSISTANCE, in the height respect of the manufacturer recommendations and the actual safety and health norms.

The devices can't be used outside a box. The user must always insert the cards in a container that respect the actual safety normative. The protection of this container is not threshold to the only atmospheric agents, but specially to mechanic, electric, magnetic, etc. ones.

To be on good terms with the products, is necessary guarantee legibility and conservation of the manual, also for future references. In case of deterioration or more easily for technical updates, consult the AUTHORIZED TECHNICAL ASSISTANCE directly.

To prevent problems during card utilization, it is a good practice to read carefully all the informations of this manual. After this reading, the user can use the general index and the alphabetical index, respectly at the begining and at the end of the manual, to find information in a faster and more easy way.

## CARD VERSION

The present handbook is reported to the **MSI 01** card release **160799**. The validity of the bring informations is subordinate to the number of the card release. The user must always verify the correct correspondence among the two denotations. On the card the release number is present in more points both board printed diagram (serigraph) and printed circuit (for example near connector CN1 both on the component side and on the solder side).

## DESCRIZIONE

The **MSI 01** is a simple interface card between the most frequently used serial communication electric protocols. In details the card converts a **TTL** serial line into an **RS 232**, **RS 422**, **RS 485** or **current loop** serial line.

The mechanical mounting of the card is simplified by four proper holes, while the electric connection is performed through two comfortable connectors: one for the TTL serial line and the other for the buffered line. The last connector follows standard **grifo**<sup>®</sup> pin out (the comfortable **CCR.Plugxx** cable can be used) that make easier the development of both point to point or network connections. The **MSI 01** typical applications are all those where data must be exchanged between two or more intelligent systems provided of a TTL serial line, especially when a noise resistant link or long distance connection is required. It is really interesting the abbination with **GPC**<sup>®</sup> **R63** control card that takes advantage of all its features.

- Converter for **TTL** serial line into **RS 232** or **RS 422** or **RS 485** or **current loop** serial line:
  - MSI 01** -> TTL to RS 232 converter
  - MSI 01.RS422** -> TTL to RS 422 converter
  - MSI 01.RS485** -> TTL to RS 485 converter
  - MSI 01.CLOOP** -> TTL to passive current loop
- Dimension: **44x33** mm, with mounting holes on the corners.
- **Screw terminal** connector, **2,54 mm** pitch, for the TTL serial line.
- **6 pins plug** connector for buffered serial line, with standard pin out.
- RS 422 transmitter enable and RS 485 line direction setting performed by a TTL digital signal available on connector.
- Termination and force circuit for RS 422 and RS 485 line, connected through jumpers.
- Single power supply voltage: **+5 Vdc; 37 mA** max.

## CN1 - SCREW CONNECTOR FOR TTL SIGNALS

CN1 is a 6 pins screw terminal connector pitch 2,54mm.

CN1 allows to interface TTL signals for serial communication from a device that is not provided with driver for most common protocols.

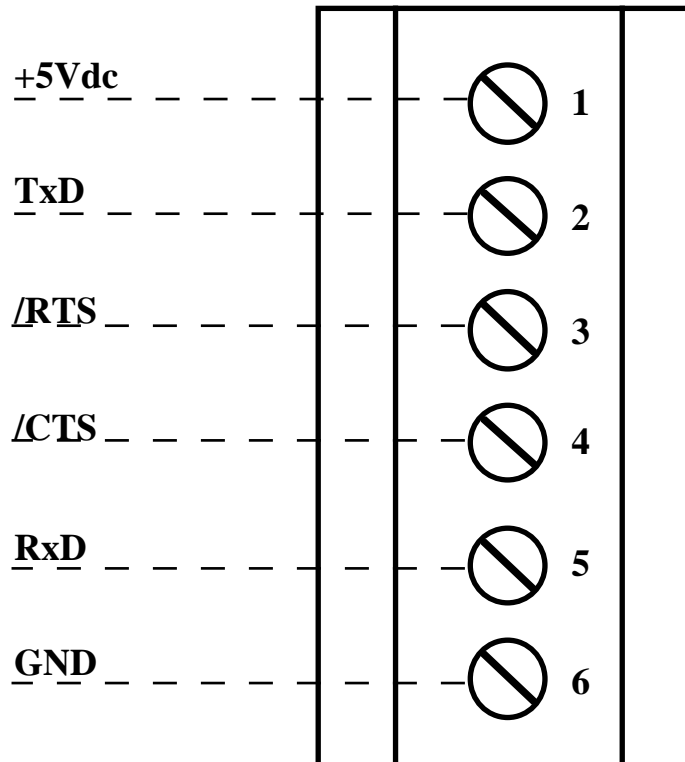


FIGURA : CN1 - SCREW CONNECTOR FOR TTL SIGNALS

Legenda:

<b>TxD</b>	= I	- TTL Transmit Data signal.
<b>RxD</b>	= O	- TTL Receive Data signal.
<b>/RTS</b>	= I	- TTL Request To Send signal.
<b>/CTS</b>	= O	- TTL Clear To Send signal.
<b>GND</b>	=	- Ground.
<b>+5 Vdc</b>	=	- Power supply +5 Vdc.

### NOTE

/RTS signal allows to manage directionality for RS 422, RS 485 drivers ; at logic level 1 the driver does not transmit, viceversa at logic level 0 the driver transmits.

## CN2 - SERIAL LINE CONNECTOR

CN2 is a 6 pins, female PLUG connector.

On CN2 are available the buffered signals for RS 232, RS 422, RS 485 or current loop. The electric protocol follows the CCITT normative and all the signals are placed in order to reduce interference and electrical noise and in order to simplify connection with other systems.

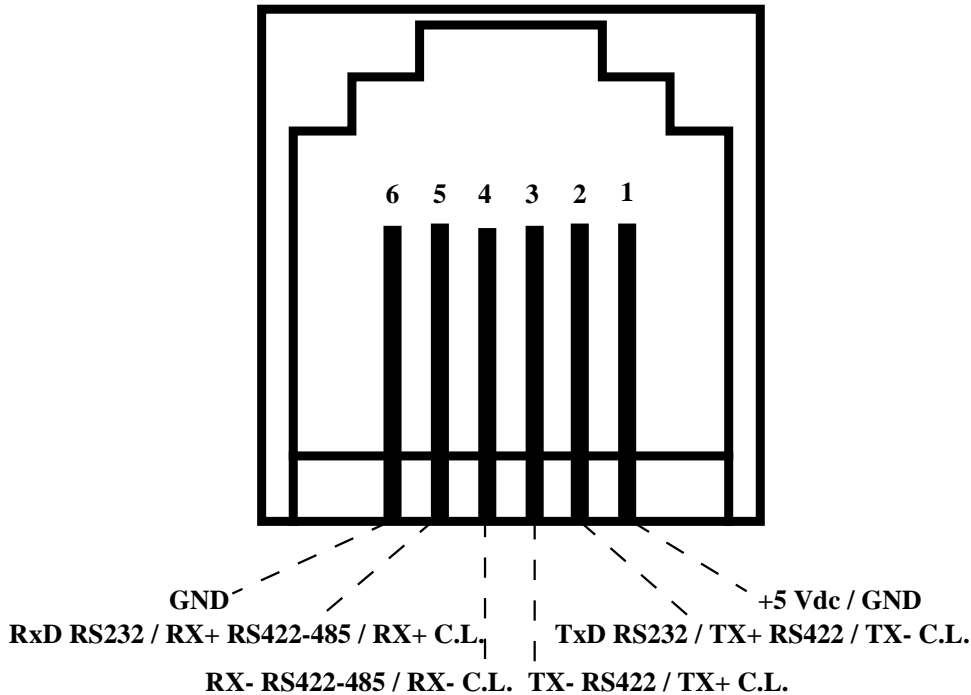


FIGURE: CN2 - SERIAL LINE CONNECTOR

Signals description:

<b>RxD RS 232</b>	= I - RS 232 Receive Data.
<b>TxD RS 232</b>	= O - RS 232 Transmit Data.
<b>RX- RS 422-485</b>	=I/O- Receive Data Negative: negative signal for RS 422 serial differential receive and RS 485 serial differential receive and transmit.
<b>RX+ RS 422-485</b>	=I/O-Receive Data Positive: positive signal for RS 422 serial differential receive and RS 485 serial differential receive and transmit.
<b>TX- RS 422</b>	= O - Transmit Data Negative: negative signal for RS 422 serial differential transmit.
<b>TX+ RS 422</b>	= O - Transmit Data Positive: positive signal for RS 422 serial differential transmit.
<b>RX- C.L.</b>	= I - Receive Data Negative: negative signal for Current Loop serial bipolar receive.
<b>RX+ C.L.</b>	= I - Receive Data Positive: positive signal for Current Loop serial bipolar receive.
<b>TX- C.L.</b>	= O - Transmit Data Negative: negative signal for Current Loop serial bipolar transmit.
<b>TX+ C.L.</b>	= O - Transmit Data Positive: positive signal for Current Loop serial bipolar transmit.
<b>+5 Vdc/GND</b>	= O - +5 Vdc or ground signal.
<b>GND</b>	= - Ground signal.

**NOTE**

Handshake signal CTSB must be connected if it is software managed, that is to acquire its logic status is not physically possible if the signal is not connected to another serial system.

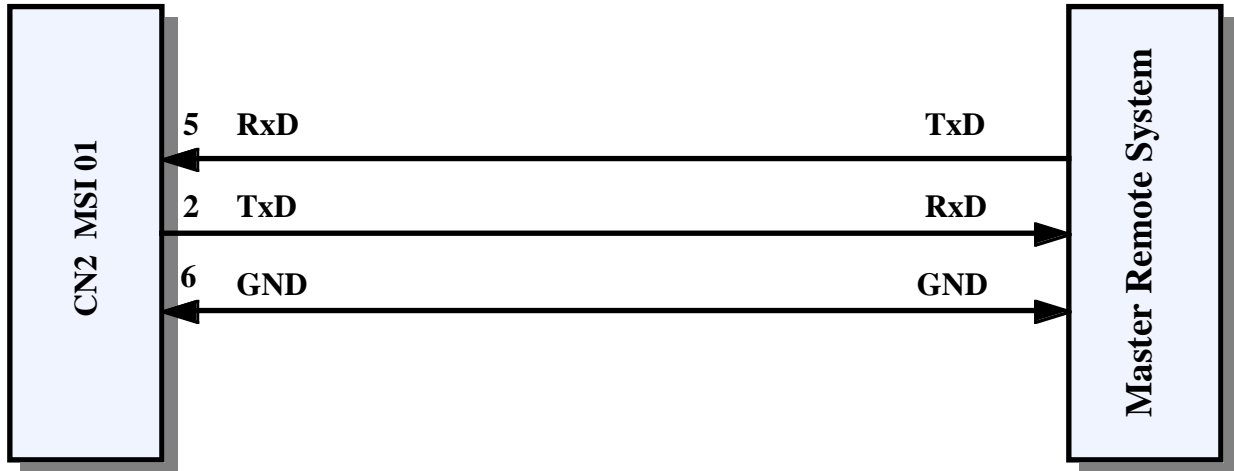


FIGURE: RS 232 PIN OUT AND CONNECTION EXAMPLE

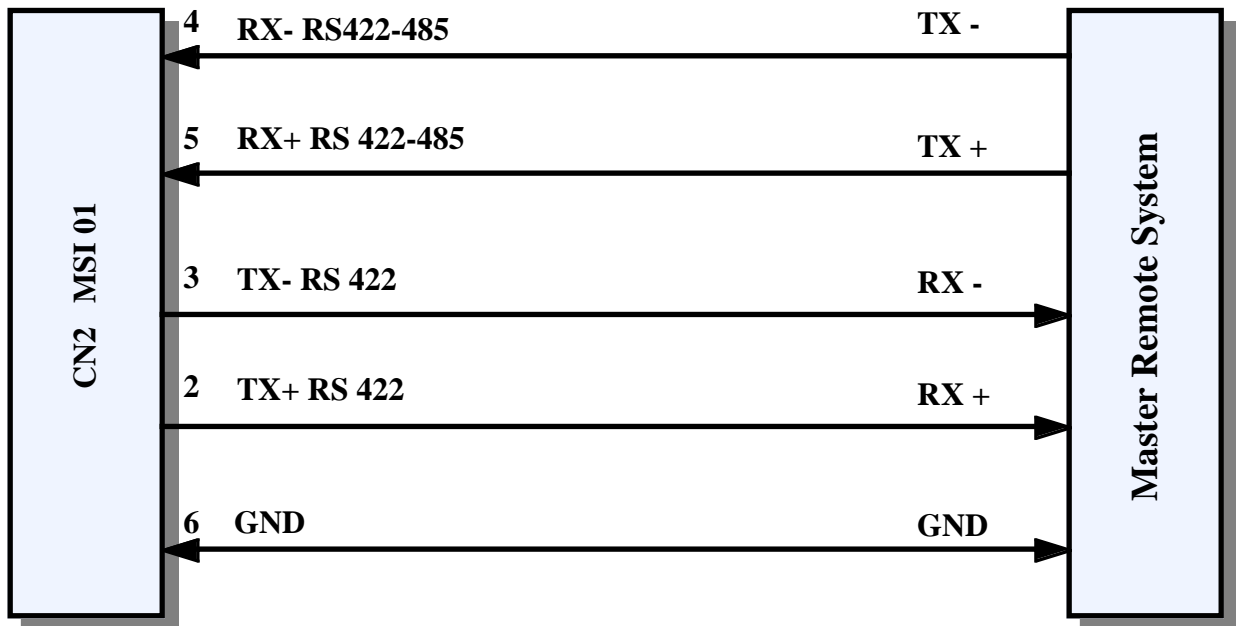


FIGURE: RS 422 PIN OUT AND CONNECTION EXAMPLE

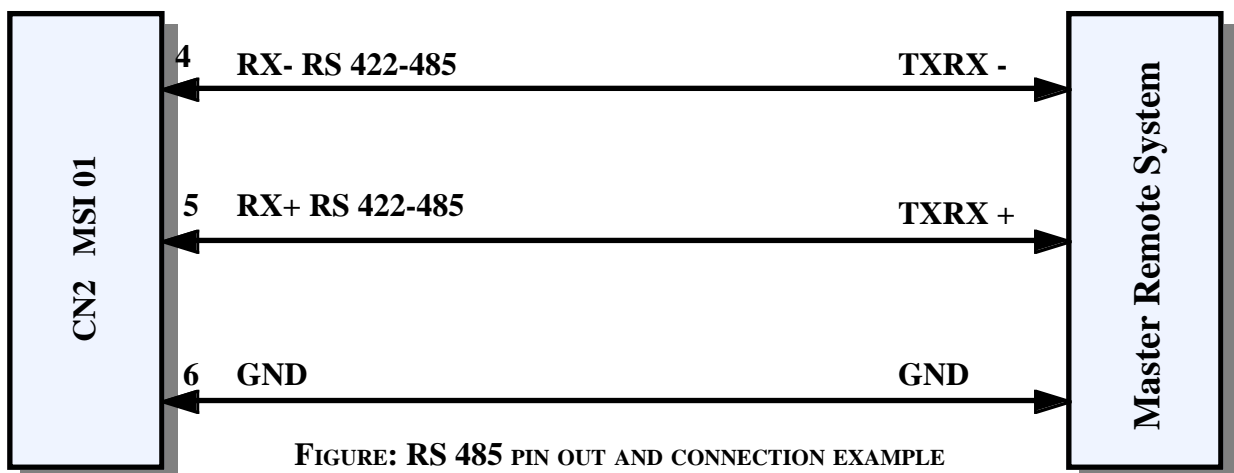


FIGURE: RS 485 PIN OUT AND CONNECTION EXAMPLE

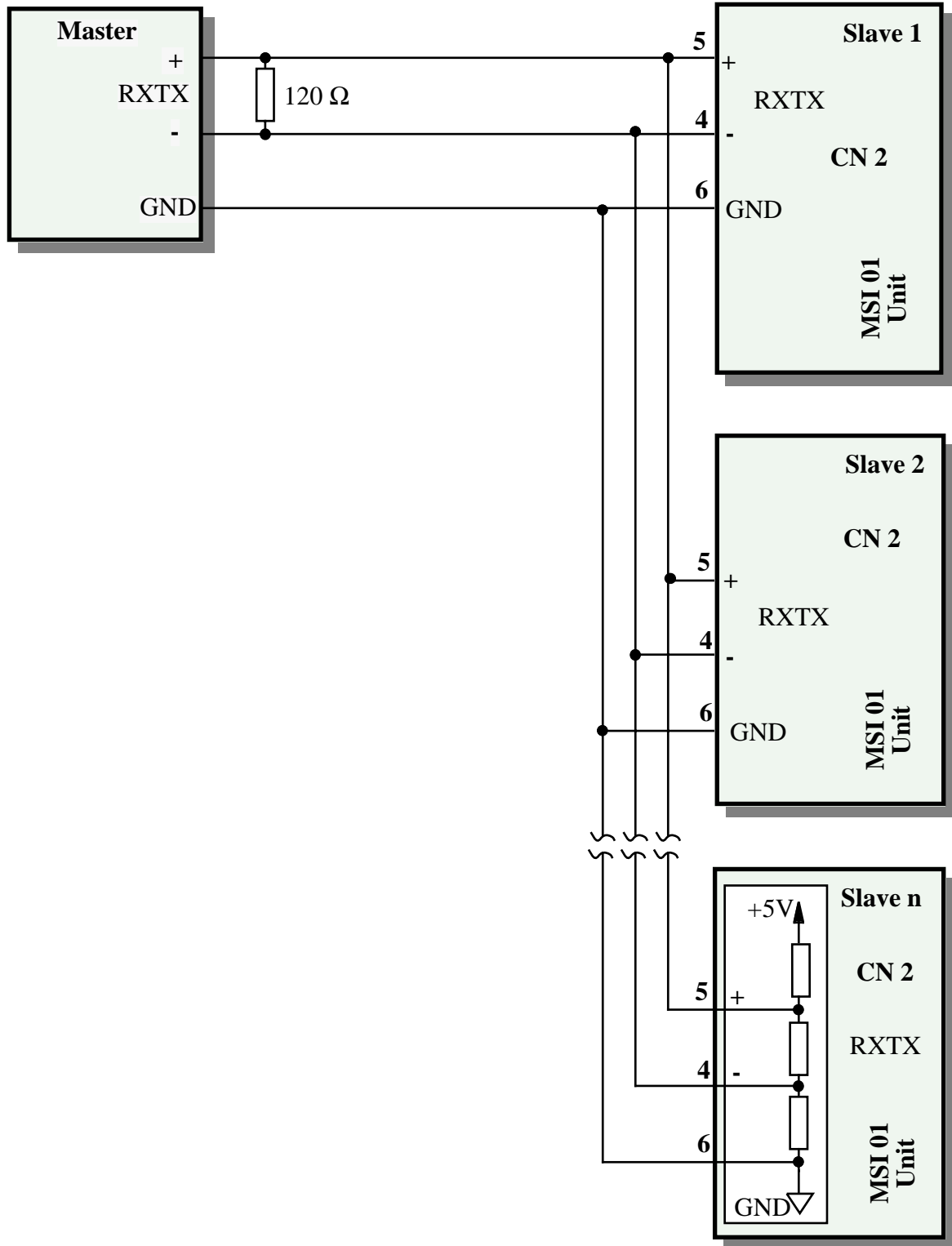


FIGURE: RS 485 NETWORK COMMUNICATION EXAMPLE

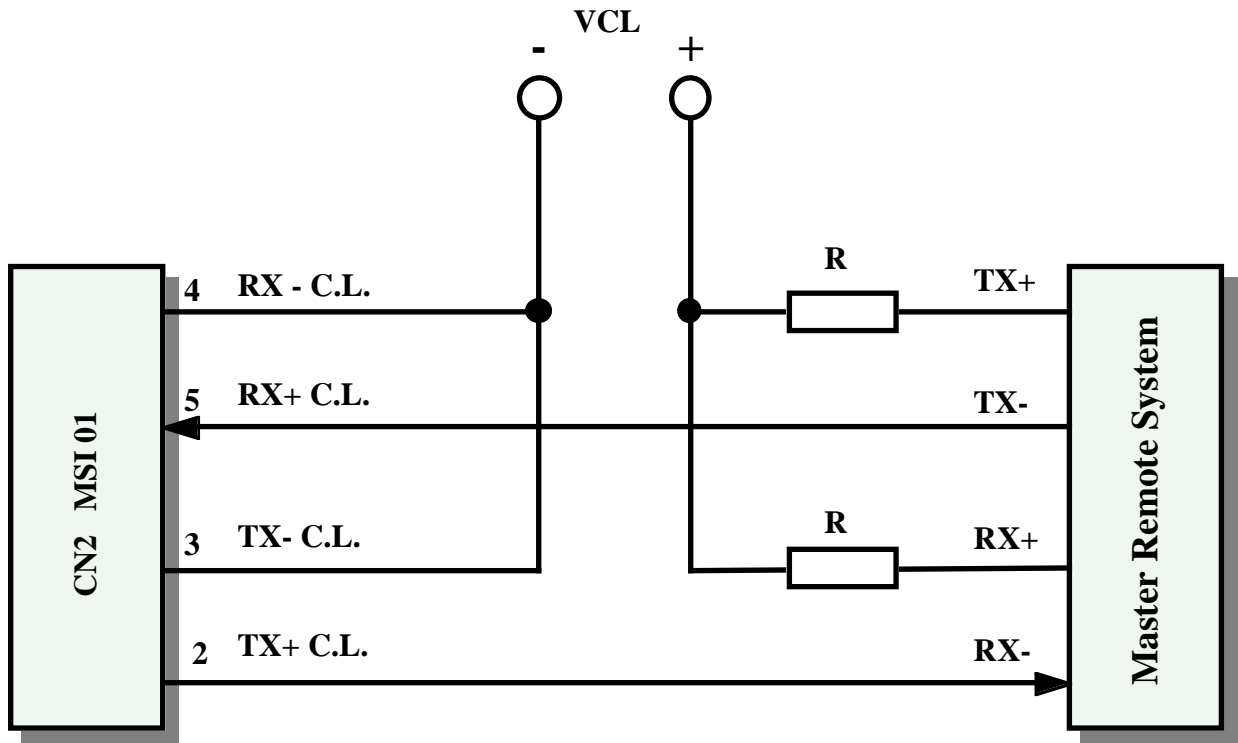


FIGURE: CURRENT LOOP PIN OUT AND 4 WIRES CONNECTION EXAMPLE

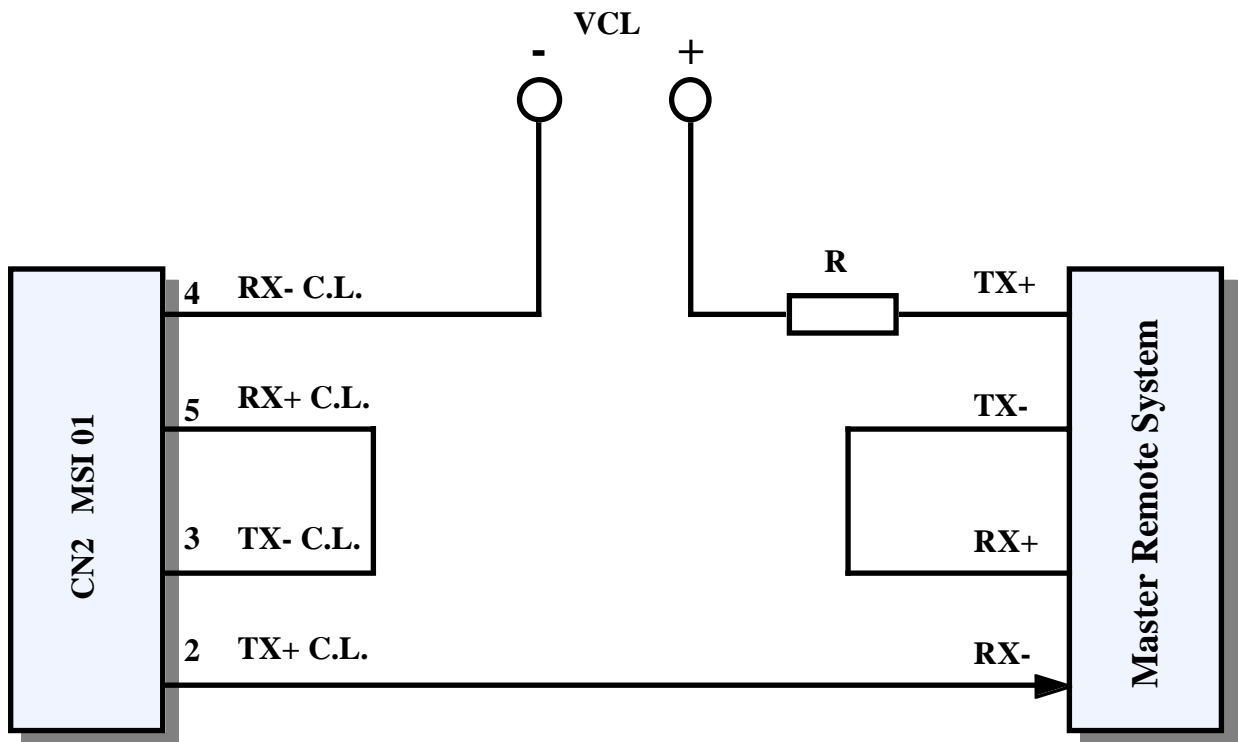


FIGURE: CURRENT LOOP PIN OUT AND 2 WIRES CONNECTION EXAMPLE

## JUMPERS

On **MSI01** there are 4 jumpers for card configuration. Connecting these jumpers, the user can define for example the memory type and size, the peripheral devices functionality and so on. Here below is the jumpers list, location and function:

JUMPERS	CONNECTION	PURPOSE	DEF.
JS1	position 1-2	Connects pin 1 of CN2 to GND.	*
	position 2-3	Connects pin 1 of CN2 to +5 Vdc.	
J1	position 1-2	Allows to use driver installed on IC2 as RS 485 receiver and transmitter.	*
	position 2-3	Allows to use driver installed on IC2 as RS 422 receiver.	
J2	not connected	Does not connect termination and forcing circuitry to RS 485 serial line or RS 422 reception line. Works in conjunction with J4.	*
	connected	Connects termination and forcing circuitry to RS 485 serial line or RS 422 reception line. Works in conjunction with J4.	
J3	not connected	Disconnects the resistor on the current loop receiver.	*
	connected	Connects the resistor on the current loop receiver.	
J4	not connected	Does not connect termination and forcing circuitry to RS 485 serial line or RS 422 reception line. Works in conjunction with J2.	*
	connected	Connects termination and forcing circuitry to RS 485 serial line or RS 422 reception line. Works in conjunction with J2.	

FIGURE: JUMPERS SUMMARIZING TABLE

## VISUAL SIGNALATIONS

**LD1** = If ON, indicates the presence of +5Vdc.