9.2.8 Extension RS485 Card (MD38TX1)

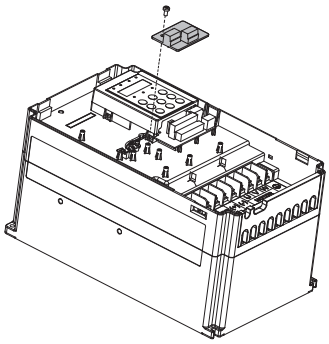
■ Overview

MD38TX1 is specially designed to provide the MD500 drive with the RS485 communication function. It adopts the isolation scheme and the electrical parameters conform to the international standard. It helps to implement control of the drive running and parameter setting through the remote serial port.

For details on this card, see the MD380 Serial Communication Protocol. You can log on to Inovance's website www.inovance.cn, or **contact the local representative office or agent to get the protocol.**

■ Physical Appearance

■ Mechanical Installation



The MD38TX1 has the same installation mode as the MD38IO2 does.

■ Description of Terminals and Jumpers

The following table describes the terminals of the MD38CAN2.

Type	Terminal	Terminal Name	Function Description
RS485 communication (CN1)	485+	RS485 positive input	RS485 communication terminal with isolation input
	485-	RS485 negative input	RS485 communication terminal with isolation input
	CGND	RS485 Power ground	Isolated power

The following table describes the jumpers of the MD38CAN2.

Jumper	Description	Meaning	Setting
J3	CANlink terminal resistor matching selection	Matching the terminal resistor	
		Not matching the terminal resistor	

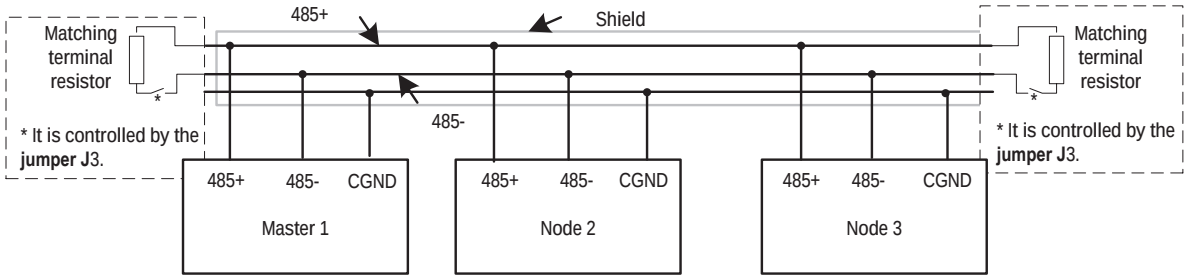
Note

The setting of the jumpers takes the top view with the main terminals at the bottom of the card as the visual angle. The jumpers are silk-screened on the card.

When applying the RS485 bus, connect a terminal resistor to the end AC drive through the jumper J3.

■ RS485 Bus Topology

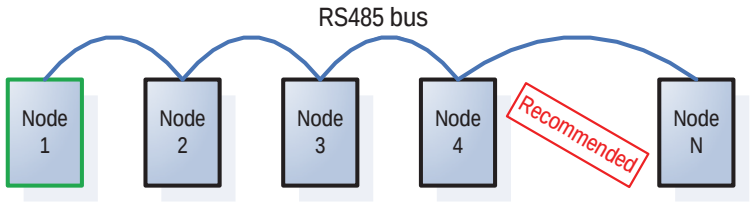
The RS485 bus topology is shown in the following figure.



It is recommended to use an STP cable as the RS485 bus and use a twisted cable to connect 485+ and 485-. Connect a matching **terminal resistor of 120 Ω respectively at both ends of the bus to prevent signal reflection. The RS485 bus allows connection of a** maximum of 128 nodes and the distance of each node branch must be smaller than 3 m. Connect the reference ground of all nodes together.

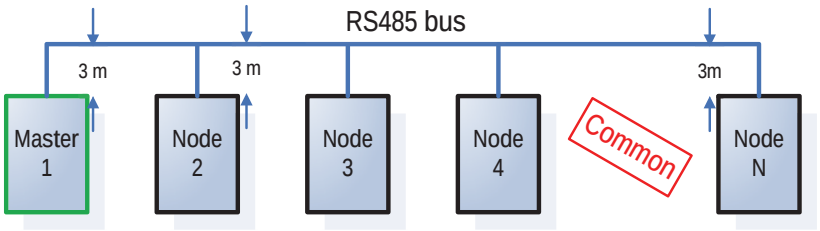
The connecting modes of multiple nodes are described as below:

1. Daisy chain connection mode (recommended)

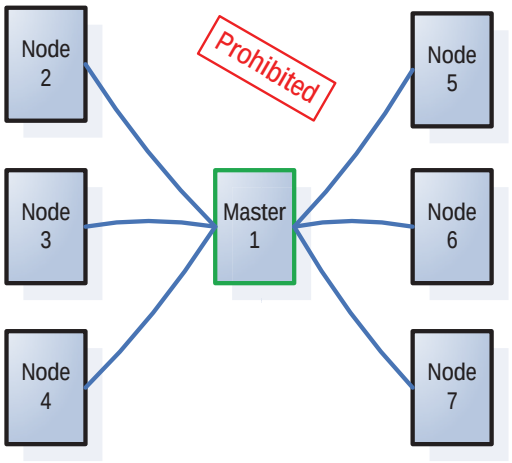


2. Branching connection mode (common)

The distance from the bus to the node cannot exceed 3 m.



3. Star connection mode (prohibited)



■ Terminal Wiring

1. Terminal wiring if the node has the CGND terminal

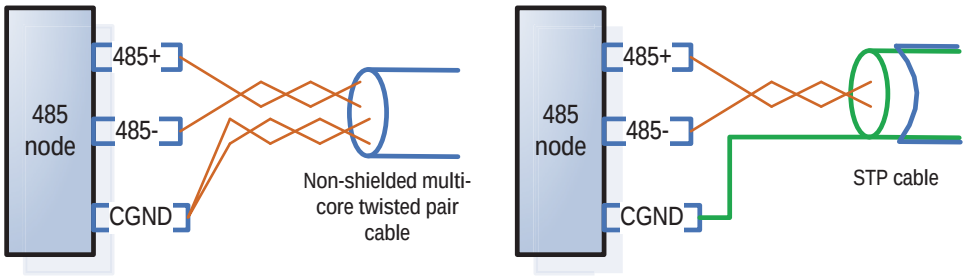
   The MD38TX1 has three cables to connect the 485+, 485- and CGND terminals respectively. Check that the RS485 bus on site has these three cables and the terminals are not connected reversely or wroingly.

   If a shielded cable is used, the shield must also be connected to the CGND terminal. Except this CGND terminal, prevent the shield from touching anywhere of the drive including the drive housing and the grounding terminal of the equipment.

   Due to cable attenuation, if the connection length is larger than 3 m, use the AGW26 or a thicker cable. Always use a twisted pair cable to connect 485+ and 485- respectively.

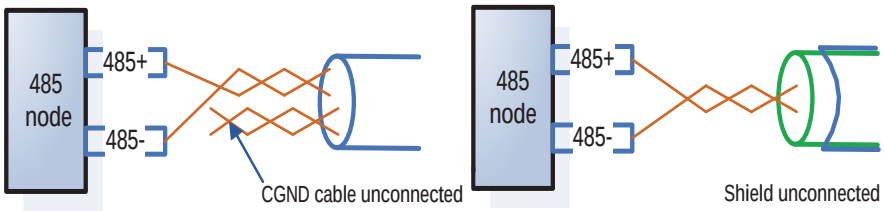
   Non-shielded multi-core twisted pair cable and STP cable are recommended. If non-shielded multi-core twisted pair cable is used, take the twisted pair to connect 485+ and 485- and twist the other unused cables into one rope and connect it to CGND.

   If an STP cable is used, connect the twisted pair to 485+ and 485- respectively and the shield to CGND. The shield can be connected to CGND only. It must not be connected to ground.



2. Terminal wiring if the node does not have the CGND terminal

   For the nodes without the CGND terminal, never connect the CGND cable or the shield to the PE of the node directly.



   Take the following steps to handle it.

   Step 1: Check whether a common reference ground of the 485 circuit exists on other ports of this node. If yes, connect the CGND cable or the shield to the pin.

   Step 2: Check whether the reference ground of the 485 circuit exists on the board of the node. If yes, connect the CGND cable or the shield to it.

   Step 3: If the reference ground of the 485 circuit is not found, keep the CGND cable or the shield unconnected and use an extra ground cable to connect this node to the PE of other nodes.

■ Transmission Distance

The maximum number of nodes and transmission distance of the standard RS485 circuit vary with different baud rates, as listed in **the following figure:**

No.	Baud Rate	Max. Transmission Distance	Number of Nodes	Cable Diameter
1	115.2 Kbps	100 m	128	AWG26
2	**19.2 Kbps**	1000 m	128	AWG26

For details of the Modbus communication protocol, see section 8.5 Modbus Communication Protocol.