

MXRL – RS485-based 8 Point Relay Board

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Please email to us, to get a copy of the MXRL software.



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1. General



Plug in USB to RS485 converter then launch the MXRL Software.

Main screen.

If Serial Com Port available, or USB Virtual Com available, it will be shown on screen.

Select the port where converter is connected, then click  to open port.

1.0 Protocol

To ease development, sending and receiving protocols are recorded and saved in the **C:\MyLab\MXRL** folder.

Communication Protocol:

Item	Value
Baud rate	9600
Data bit	8
Parity	None
Stop bit	1

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For card related command:

TX : 02 / 33 / ID / No of byte / Command / Data / BCC / 03

Item	Length	Meaning
STX (Start of Text)	1	02
MID	1	33
Relay Board ID	1	00 – FF hex
No of byte/NOB	1	No of byte in Data field
Command/CMD	1	15 hex = Trigger Relay
Data	variable	First 2B is Relay Trigger Length, and subsequent byte(s) is Relay trigger list.
BCC	1	Exclusive-Or from byte STX to the byte before BCC
ETX (End of Text)	1	03

1.1 Relay Board ID

The accepted range for the ID is 0 to 15, and 255.

When the ID is set to 00 to 15, only the Relay Board with the same ID on the RS485 bus, will response and trigger relay according to the relay list in the string. Example: if the ID is 2, only relay board with ID 2, will trigger relay, all other IDs will not response.

When the ID is 255, it means broadcast. All the relay board connected on the same RS485 bus, will receive and response to the received string.

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2. How to send string to trigger relay.

Imagine we have 5 relay board connected on a same RS485 bus. Their IDs are; 00, 01, 02, 03, and 04 respectively.

Now, we will energize relay 1 and 2, on relay board ID 01, for a duration of 8 seconds. We can set like as shown in the following diagram.

The screenshot shows the MXRL software window with the following settings:

- Port:** COM28 (selected in a dropdown menu)
- ID:** 1 (selected in a dropdown menu, highlighted with a red box)
- Trigger Length:** 8 (selected in a dropdown menu, highlighted with a red box)
- Relay Selection:** Under the 'Relay 1' column, 'Relay 1' and 'Relay 2' are checked (highlighted with a red box).
- Buttons:** 'Open', 'Close', and 'Write' buttons are visible.

Instructions within the software window:

- Before launching this program:
 - Install FT232RL driver.
 - Plug in USB-RS485 Converter
- If converter is detected, the Port will display the Port Number. Then click 'Open' to start.
- If length is 0, the selected relay will be in 'ON' state.
- If length > 0, the selected relay will be triggered 'ON' for length's second, then triggered 'OFF'.

Make sure the port is Open. Click  to send out the protocol string.

The above setting will trigger relay 1 and 2, on relay board ID 01, for 8 seconds.

Only relay board ID 01 will response, the other boards are idle.

From the C:\MyLab\MXRL, the sending string is as follow:

Function: Open Port

9:03:10 PM, TX: 02 33 01 04 15 08 00 03 2A 03

The 08 00 is the relay trigger length. (08 00 hex = 08, start from LSB to MSB.)

The 03 is the relay trigger list. (03 hex = 0000 0011b. The leftmost 2 bits denote relay 1 and 2. The bit location and meaning; bit7 = relay 8, bit6 = relay 7, bit5 = relay 6, bit4 = relay 5, bit3 = relay 4, bit2 = relay 3, bit1 = relay 2, bit0 = relay 1.)

But if we want to trigger more relay and on different relay boards, then we can combine the relay trigger info, and then broadcast the string to all the connected relay boards.

The following diagram shows the setting:

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MXRL

Main Info

Before launching this program:
- Install FT232RL driver.
- Plug in USB-RS485 Converter

Port: COM28

ID: 255

Relay Board ID: 255

Trigger Length: 16

Select Relay To Be Triggered

Relay 1: ☒ Relay 1, ☒ Relay 2

Relay 2: ☐ Relay 1, ☐ Relay 2, ☒ Relay 3, ☒ Relay 4

Relay 3: ☐ Relay 1, ☐ Relay 2, ☐ Relay 3, ☐ Relay 4, ☒ Relay 5, ☒ Relay 6

Relay 4: ☐ Relay 1, ☐ Relay 2, ☐ Relay 3, ☐ Relay 4, ☒ Relay 7, ☒ Relay 8

Relay 5: ☐ Relay 1, ☐ Relay 2, ☐ Relay 3, ☐ Relay 4, ☐ Relay 5, ☐ Relay 6, ☐ Relay 7, ☐ Relay 8

Relay 6: ☐ Relay 1, ☐ Relay 2, ☐ Relay 3, ☐ Relay 4, ☐ Relay 5, ☐ Relay 6, ☐ Relay 7, ☐ Relay 8

Relay 7: ☐ Relay 1, ☐ Relay 2, ☐ Relay 3, ☐ Relay 4, ☐ Relay 5, ☐ Relay 6, ☐ Relay 7, ☐ Relay 8

Relay 8: ☐ Relay 1, ☐ Relay 2, ☐ Relay 3, ☐ Relay 4, ☐ Relay 5, ☐ Relay 6, ☐ Relay 7, ☐ Relay 8

Relay 9: ☐ Relay 1, ☐ Relay 2, ☐ Relay 3, ☐ Relay 4, ☐ Relay 5, ☐ Relay 6, ☐ Relay 7, ☐ Relay 8

Relay 10: ☐ Relay 1, ☐ Relay 2, ☐ Relay 3, ☐ Relay 4, ☐ Relay 5, ☐ Relay 6, ☐ Relay 7, ☐ Relay 8

Relay 11: ☐ Relay 1, ☐ Relay 2, ☐ Relay 3, ☐ Relay 4, ☐ Relay 5, ☐ Relay 6, ☐ Relay 7, ☐ Relay 8

Relay 12: ☐ Relay 1, ☐ Relay 2, ☐ Relay 3, ☐ Relay 4, ☐ Relay 5, ☐ Relay 6, ☐ Relay 7, ☐ Relay 8

Relay 13: ☐ Relay 1, ☐ Relay 2, ☐ Relay 3, ☐ Relay 4, ☐ Relay 5, ☐ Relay 6, ☐ Relay 7, ☐ Relay 8

Relay 14: ☐ Relay 1, ☐ Relay 2, ☐ Relay 3, ☐ Relay 4, ☐ Relay 5, ☐ Relay 6, ☐ Relay 7, ☐ Relay 8

Relay 15: ☐ Relay 1, ☐ Relay 2, ☐ Relay 3, ☐ Relay 4, ☐ Relay 5, ☐ Relay 6, ☐ Relay 7, ☐ Relay 8

Relay 16: ☐ Relay 1, ☐ Relay 2, ☐ Relay 3, ☐ Relay 4, ☐ Relay 5, ☐ Relay 6, ☐ Relay 7, ☐ Relay 8

Write

Click  to send out the string to all the relay boards.

We set Relay Board ID to 255, which means broadcast.

This time we set the trigger length to 16 seconds, and set the relay trigger info for 4 relay boards.

From the C:\Mylab\MXRL, the sending string is as follow:

9:11:00 PM, TX: 02 33 FF 13 15 10 00 03 0C 30 C0 00 00 00 00 00 00 00 00 00 00 00 00 27 03

The 10 00 is the relay trigger length. (10 00 hex = 16, start from LSB to MSB.)

The 03 0C 30 C0 is the relay trigger list. (0000 0011, 0000 1100, 0011 0000, 1100 0000b. The first byte is for Relay board ID 1, second byte is for Relay board ID 2, and etc. In the first byte, bit 0 and 1 is set to '1', means trigger relay 1 and 2. And in the second byte, bit 2 and 3 is set to '1', means trigger relay 3 and 4.)

3. End