

COMMUNICATION PROTOCOL FOR MODULE AND MAIN CONTROLLER

Requirements

A Bidirectional communication protocol which can transfer actuation bytes from Main controller to the Modules and cursor key Information from Modules to Main controller in a single serial port. The communication hierarchy is as shown below

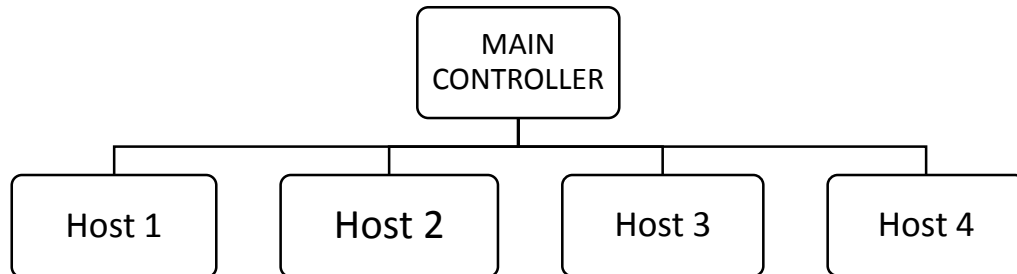


Figure 1: Communication Hierarchy of Main controller and Module

Proposed Protocol:

The protocol is to use the UART interface in **Daisy-chain** structure as shown in the figure below where the TX and RX are connected in Daisy chain structure which makes the system to use only one set of TX and RX pin from controller to transfer data between modules. The data is transferred in the form of packets with each packet containing source and destination addresses attached to it. The data packet is decoded at each level and it is either propagated to next module or kept at same module based on the destination address. In this way the data gets transferred from both the Main controller to Module and vice versa. The address for each module can be set by the use of **Jumper** setting provided in each module making the software remain identical for all the modules.

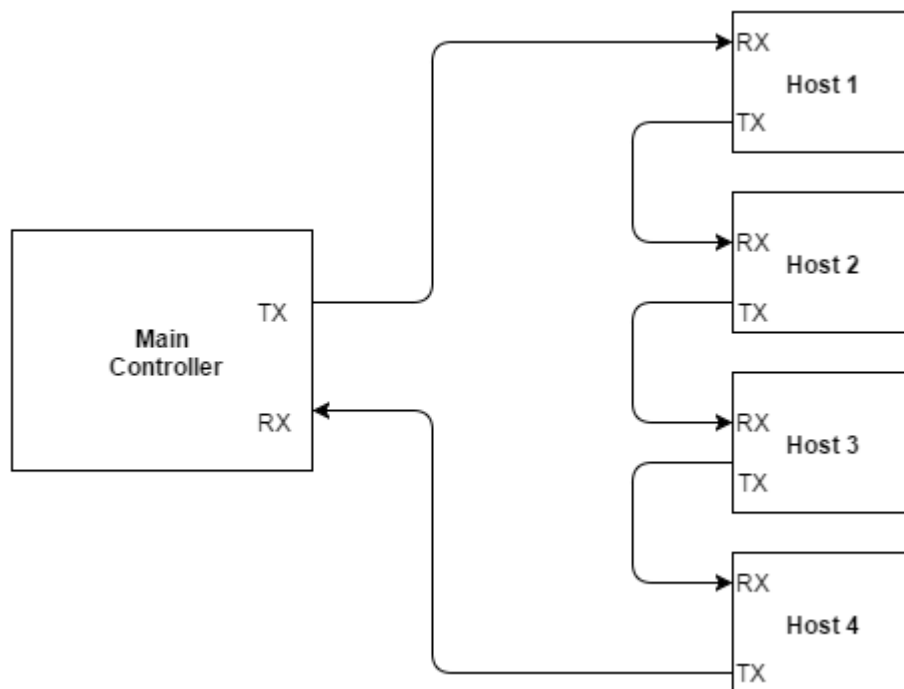


Figure 2: Communication Protocol using UART

Packet Format

The sample data packet is shown below where the data is accompanied with source and destination. The maximum size of data can 32Bytes.

Start byte	Data length	Source Address	Destination Address	Command	Data	Checksum	End byte
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Table 1: Size and Range of Data

	Valid Value/Range	Size
Start Byte	128	1 Byte
Data length	1 to 25	1 Byte
Source Address	0 to 10	1 Byte
Destination Address	0 to 10	1 Byte
Command	0 to 255	1 Byte
Data	0 to 255	25 bytes
Check Sum	0 to 255	1 Byte
End Byte	129	2 Byte

For data transfer from Main controller to Host 2 let us assume the Main controller is assigned the address 6 (say) and the Host 2 is assigned address 2 (say) then the packet from Main controller would be as shown below which will travel through Host 1 to reach Host 2

0x80	0x0a	0x06	0x02	0x02	0x10 0x12 0x30 0x65 0x34 0x65 0x87 0x98 0x56 0x76	0x10	0x81
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Similarly to transfer cursor information from the module to Main controller the module forms a packet and transfers it to its next module or Main controller and based on the destination address in the packet the Data gets decoded in the Main controller. An example for cursor info transfer is shown below.

0x80	0x01	0x02	0x06	0x03	0x04	0x08	0x81
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