

M-BUS Automatic Meter Reading System Introduction

——LSD-MBUS-03A_V3.0

Chapter I: Overview

LSD-MBUS-03A_V3.0 M-BUS Automatic Meter Reading System adopt TI's design which is based on the European Instrument Bus standard and has been used for many years in developed countries.M-BUS meter reading plays a very important role in AMR application area. It is mainly used for data collection, remote transmission,etc. Its most important feature of the system is:long-distance communication,easy for project wiring,accurate meter reading and low cost.It is very convenient and easy to read kinds of meter (such as water,electricity, gas and heat meter) especially for residential areas and urban high-rise buildings , also other areas which need remote data transmission.

Chapter II: The Main Function

Users can use this M-BUS system as a mater or repeater which depend on the practical necessity. This system can't work without a slave which has ability of processing M-BUS data. A slave can be any device which has M-BUS interface.

- 1.Master Function: to provide bus circuit and transport collected data to PC.
- 2.Repeater Function: transmit and receive data from previous master or next slave
- 3.Communication with PC: communication with PC through RS232 interface, users can manage all slaves through PC software.
- 4.Remote Power supply: slave can use the power supplied by previous master to work without other external power supply.
- 5.Over-current Protection: When the current flow is too big, which caused by too many slaves or short-current or wires damaged, the M-BUS system will activate the protection function,it cut off the BUS power automatically, and when the error removed, M-BUS system can get the power again by pressing the reset button for a few seconds.

Chapter III: Hardware Diagram And Interface Description

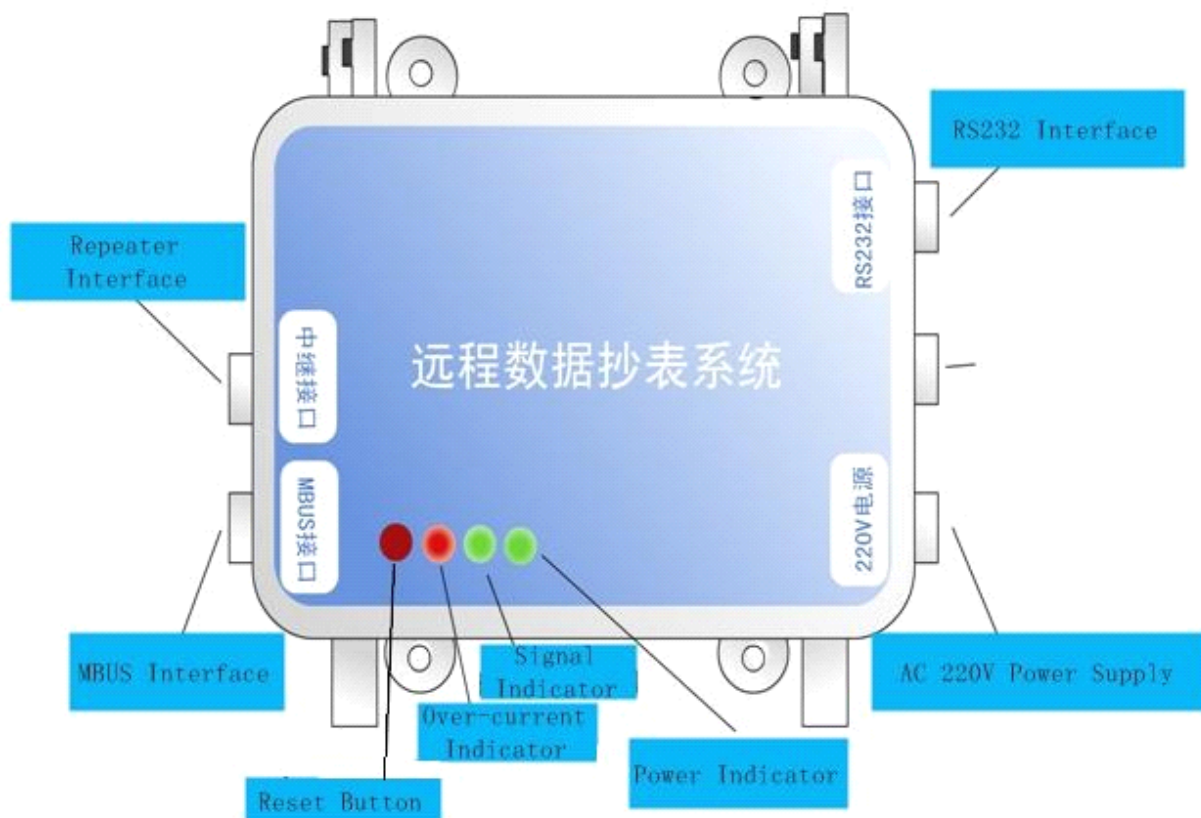


Figure 1 M-BUS Hardware Structure

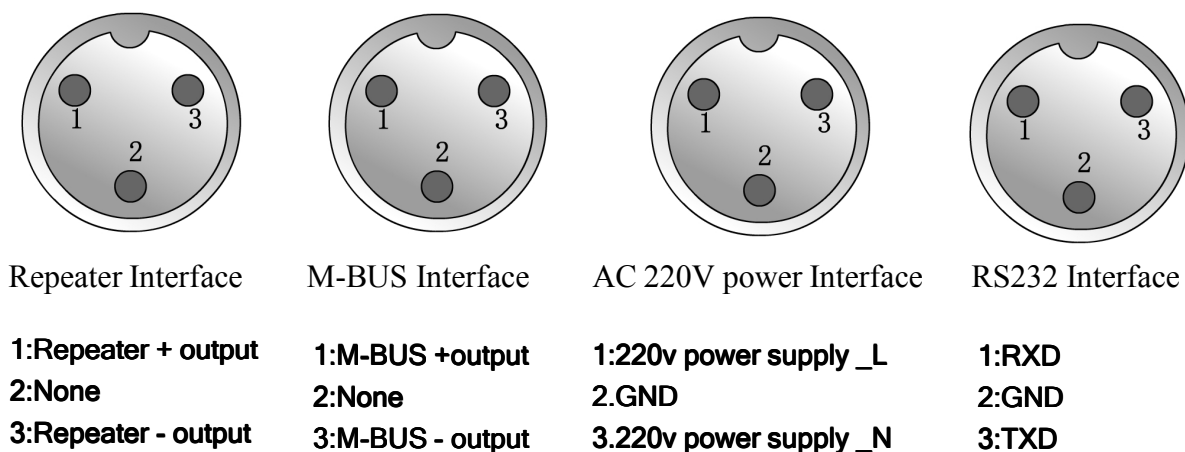


Figure 2 M-BUS Interface

Interface Description

-Repeater Interface: Previous master M-BUS signal input to this interface when M-BUS system is used as a repeater.

-M-BUS Interface: master 's M-BUS signal output from this interface, and input to M-BUS interface of repeater or slave .

-AC 220V Power Interface: AC 220V power input to this interface.

-RS232 Interface: Users can connect PC and master or repeater through this interface to collect data and transmit control command.

Cables Description



Figure 3 Power Cable



Figure 4 Serial Port Cable

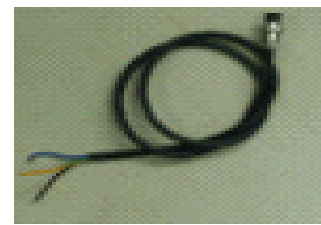


Figure 5 Data Cable

-Power Cable:it is used to connect AC 220V power and M-BUS power interface.

-Serial Port Cable:It is used to connect RS232 interfaces of M-BUS system and PC.

-Data Cable:it is used to connect previous master's M-BUS interface and next repeater interface or slave 's M-BUS interface.

Reset Button And The Indicator Lights Description

-Reset Button: it is used to reset the system.If it is over-current, the system will activate the protection function to cut off M-BUS voltage output. After troubleshooting, It is necessary to click the reset button to return normal work.

-Power Indicator Light: when the system power supply is normal, this light is always bright.

-The Over-current Indicator: Light. There is no this function in this system.

-Signal Light: There is no this function in this system.

Chapter IV: The Operatting Procedure

Used As Master

-Supply the 220V power to power interface, connect RS232 interface and PC with serial port cable, connect master and slave or repaeter with a data cable as Figure 6.

-Power on. After the power indicator light, do the next step operation.

After PC software sends an control command, observe the results between the master and slave through the PC software interface. Please note the protocol between PC and slave must be built before using.

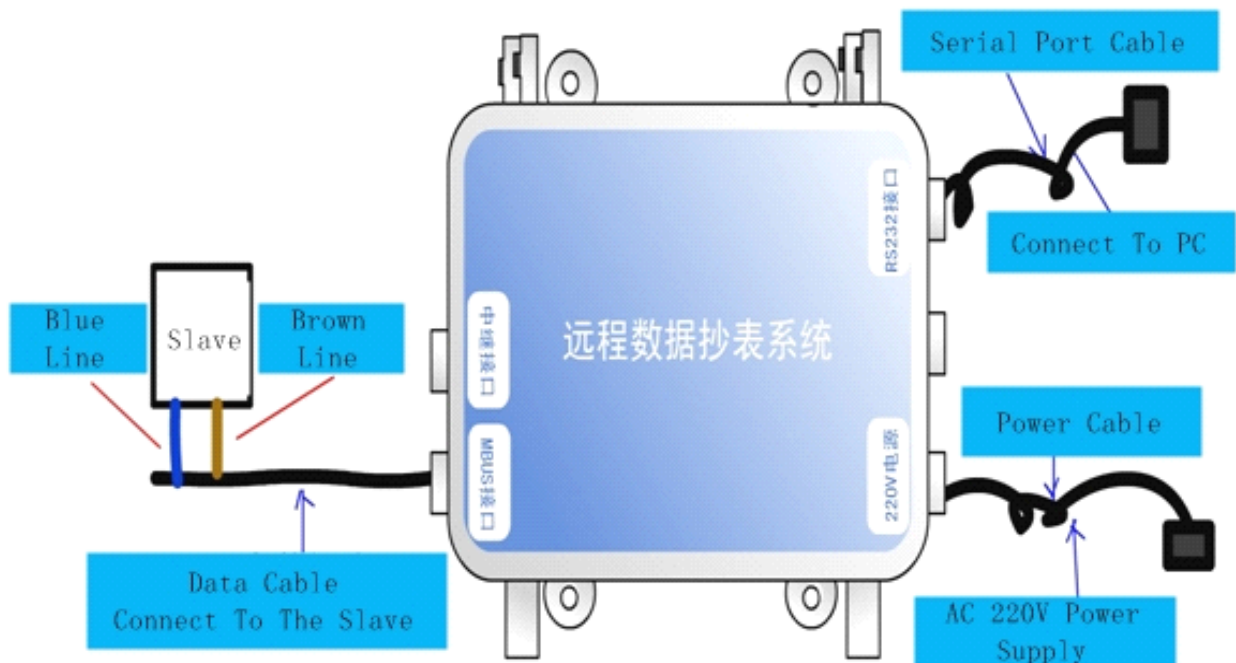


Figure 6 connection diagram when this system is used as master

Used As Repeater

-Supply power AC 220V power to power interface, connect this repeater and previous repeater or master with a data cable, connect this repeater and slave with another data cable as Figure 7.

-Power on, after the power indicator light, do the next step operation.

-Input the M-BUS signal from previous repeater or master to this repeater.

-After connection, transmit and receive data through PC software. Then we can observe the result through PC software or slave LCD display which connect with this repeater.

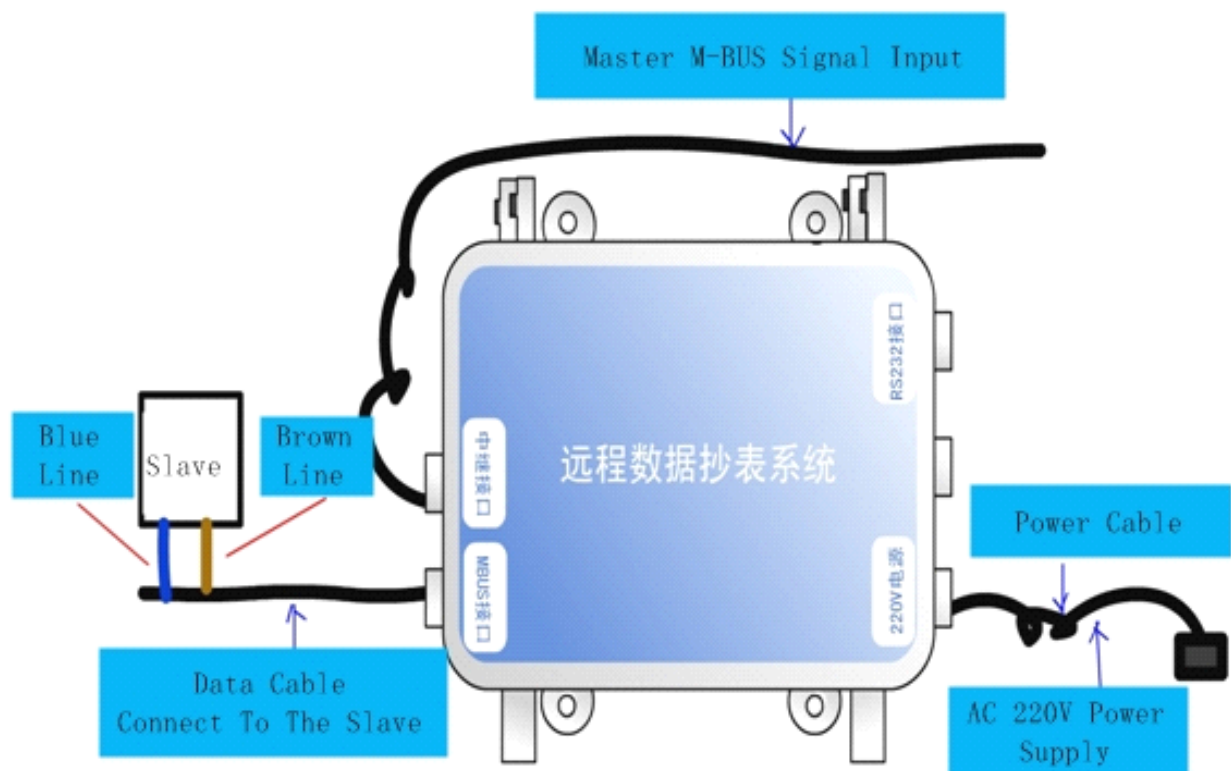


Figure 7 connection diagram when this system used as repeater

Whole System Connection Diagram

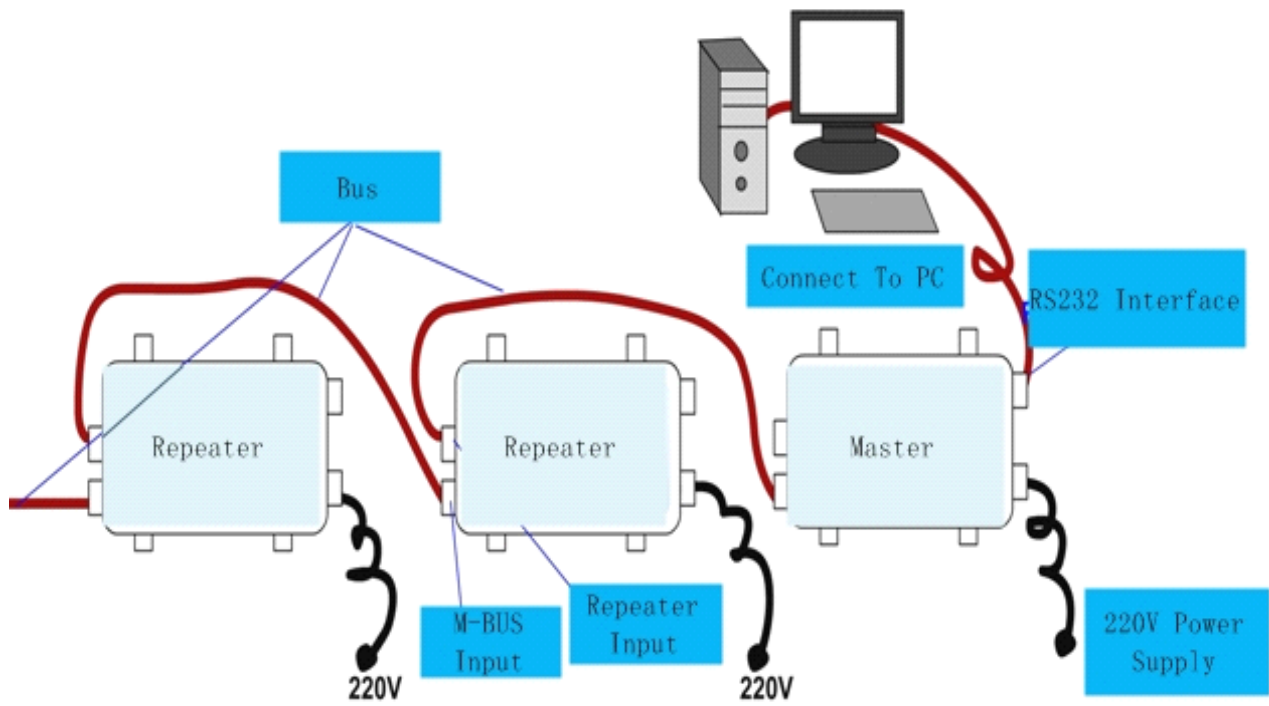


Figure 8 connection diagram of whole system

Chapter VI: Parameters Data

Parameters	Data
Display Mode	LED indicator
Operating Temperature Range	0°C~50°C
Work Voltage	220V AC
Master PC Interface	Standard RS232 Interface
Total Current	≤120mA
Current For Repeater	≤3mA
Overload Current	200mA±10%
Transmission Distance	≤ 1Km (it will be changed by number of nodes and cable impedance)
Communication Baud Rate	300/4800bps
Number Of Nodes	64UL (The change of transmission distance and cable impedance will effect the number of nodes)
Bus Voltage	31V+/- 1.5V(Idle) (Bus voltage will decrease with the increase of number of nodes, cable impedance and transmission distance. When the total current add 10mA, the BUS voltage will decrease 0.24V, users must ensure the voltage of farthest slave is more than 21V.)

Table 1 System Parameter Table

Chapter VII: Notes

1. When users using this system for development, please pay particular attention to: Do not connect your developed systems or the target board to the evaluation board directly, because the power supply for this system and your board are not same, it will cause damage.
2. When users begin to development, it is necessary to use an isolated type of adapter board or cut off the power supply of this system.
3. Please use this system in dry environment.
4. When users watch the M-BUS voltage though an oscilloscope, please don't make the clip and probe of oscilloscope connect the BUS directly, ensure the clip connect to GND and the probe connect to any one wire of bus to avoid damage.
5. Bus voltage will decrease with the increase of number of nodes, cable impedance and transmission distance. You should pay attention to choice right cable and observe the bus voltage at the same time, if the bus voltage of furthest end the cable drop to 21V or less, repeater stations should be used to deal with in order to maintain circuit stability.
6. The number of nodes will decrease with the increase of load, line impedance and transmission distance. You should pay attention to the choice of communications cable and observe the bus voltage at the same time. When the most long-distance bus voltage down to 21V or less, in order to maintain circuit stability, a repeater is necessary.
7. Communication cables can be a telephone line, standard cables, special cables and so on. The choice of cable will affect the number of nodes and transmission distance, so please select the appropriate cable depend on your requirement .