HM-TR Transparent Wireless Data Link Module

1. General

HM-TR series transparent wireless data link module is developed by Hope microelectronics Co. Ltd, dedicated for applications that needs wireless data transmission. It features high data rate, longer transmission distance. The communication protocol is self controlled and completely transparent to user interface. The module can be embedded to your current design so that wireless communication can be set up easily.

2. Features

1. FSK technology, half duplex mode, robust to interference
2. ISM band, no need to apply frequency usage license
3. Operation frequency can be configured and can be used in FDMA applications
4. Transmitting frequency deviation and receiver bandwidth can be selected.
5. Protocol translation is self controlled, easy to use.
6. Data rate can be select from a wide range.
7. Provide ENABLE pin to control duty-cycle to satisfy different application requirements
8. High sensitivity, long transmission range.
9. Standard UART interface, TTL or RS232 logic level selectable
10. Very reliable, small size, easier mounting.
11. No tuning in producing

3. Application

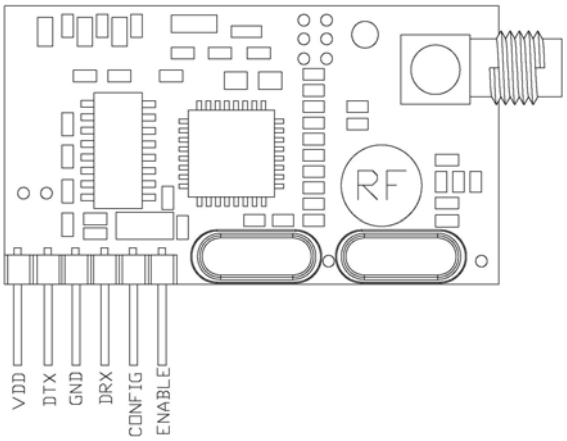
1.Remotecontrol,remote measurement system
2. Wireless metering
3. Access control
4. Identity discrimination
5. Data collection
6. IT home appliance
7. Smart house products
8. Baby monitoring

4. Mechanical appearance

HM-TRXXX-232

HM-TRXXX-TTL

5. Pin definition



Pins	title	description
VCC	Power supply	+5V
DTX	Data transmission	Module data transmission
DRX	Data receiving	Module data receiving
CONFIG	Configure mode	If CONFIG pin is high at power on, the module enter configure mode to set up work parameters.
ENABLE	Working funtion	If config pin is low at power on, the module will enter normal mode for data transmission

6. Module parameters

Basic parameters

Working Voltage	Description	Min.	Typ.	Max.	5V
Working temperature		-35	25	80	℃
Working frequency	4 standard frequency	310.24	-	929.27	MHz
power	Pmax depends on the specific frequency	Pmax-21	Pmax	Pmax	dBm
frequency deviation		15		240	kHz
Receiving bandwith		67		400	kHz
UART Baud Rate		300	9600	19200	bps
UART data bit		5	8	9	bit
Check bit	No check or Parity check				
Stop bit		1	1	2	bit
Antenna Connector					SMA (female)
Module size					24×43mm

Working frequencies

Module P/N	description	minimum	typical	maximum	Unit
HM-TR315		310.24	315	319.75	MHz
HM-TR433		430.24	434	439.75	MHz
HM-TR868		860.48	869	879.51	MHz
HM-TR915		900.72	915	929.27	MHz

Maximum transmission power

Module P/N	description	minimum	typical	maximum	Unit
HM-TR315			8		dBm
HM-TR433			8		dBm
HM-TR868			4		dBm
HM-TR915			4		dBm

Receiving sensitivity

Module P/N	description	minimum	typical	maximum	Unit
HM-TR315			-109	-100	dBm
HM-TR433			-109	-100	dBm
HM-TR868			-109	-100	dBm
HM-TR915			-109	-100	dBm

Working current in transmitting

Module P/N	description	minimum	typical	maximum	Unit
HM-TR315	TTL Output connector			48	mA
HM-TR433				48	mA
HM-TR868				50	mA
HM-TR915				50	mA

Working current in receiving

Module P/N	description	minimum	typical	maximum	Unit
HM-TR315	TTL Output connector			34	mA
HM-TR433				34	mA
HM-TR868				36	mA
HM-TR915				36	mA

Static Current

Module P/N	description	minimum	typical	maximum	Unit
HM-TR315	TTL Output connector		0.5	1	uA
HM-TR433			0.5	1	uA
HM-TR868			0.5	1	uA
HM-TR915			0.5	1	uA

Reliable communication distance

Module P/N	description	minimum	typical	maximum	Unit
HM-TR315	Tested in free open area by keeping the modules 1 meter above the ground			230	m
HM-TR433				330	m
HM-TR868				220	m
HM-TR915				230	m

7. Module application

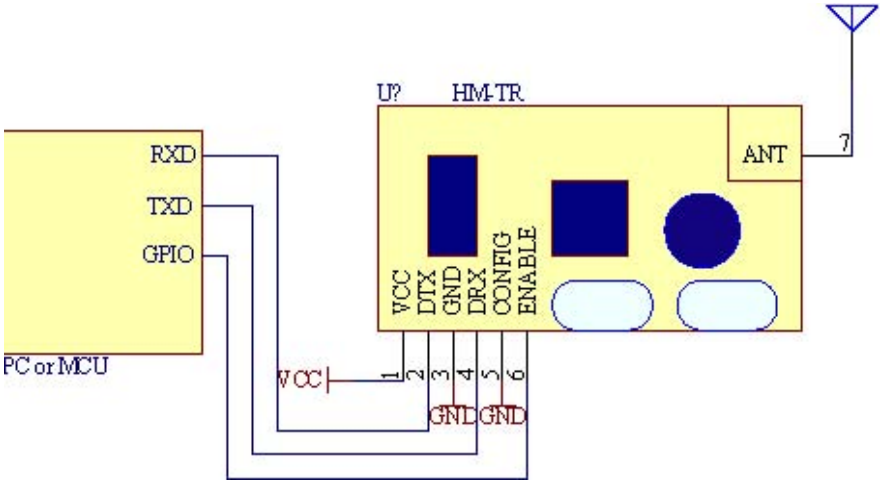
Module has two modes: communication mode and configure mode, it is determined by the status of CONFIG pin when power on:

CONFIG=LOW：It enter communication mode for data transmission

CONFIG=HI：It enter configure mode to setup work parameters

1. Communication mode

If CONFIG pin is low when powering on, the module will enter into communication mode. The module provide RS232 connector to connect with PC or TLL level with MCU directly



Communication Diagram

It can work properly with the default configuration (default configure is 9600，8，N，1）. the module work parameters can be set up via HM-TR setup tool.

When the serial data rate is below 9600bps，HM-TR module supports continuous transmission and the maximum data stream can reach 1000000bytes; however, the data transmitted each time should not exceed 32bytes in high-speed applications（>9600bps）.

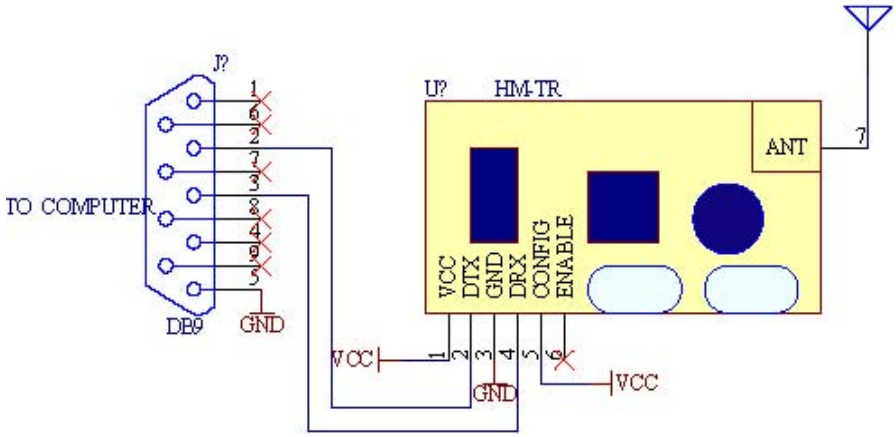
HM-TR module work in half-duplex mode. When receiving 32 Bytes from the serial port, it will send data out at once. If the data package received is below 32 Bytes, the module will wait for about 30 ms and then send it. In order to send data immediately, 32 Bytes data per transmission is necessary.

After each transmission, HM-TR module will be switched to receiver mode automatically. The switch time is about 5ms.

ENABLE pin is used to control the power consumption. Once this pin is pulled down, the module will enter into sleep mode immediately. Users can use this pin to control the receiving duty circle.

2．Configuration mode

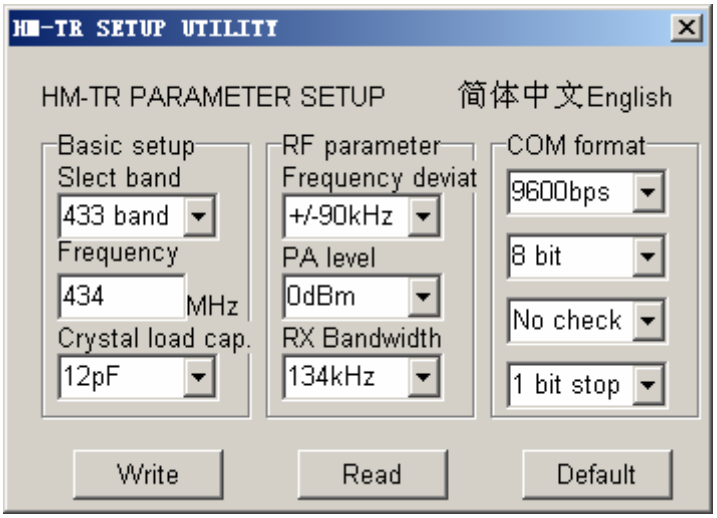
If the CONFIG pin is in high level when powering on, the module will enter into configuration mode automatically. In this mode the module communicates with the host in fixed serial format（9600，8，N，1）.



Configure mode connection

HM-TR setup software

You can check the parameters of HM-TR and set up the parameters via HM-TR setup software below:



“Read” button: Read the parameters the module currently use;

“Write” button: Write new configuration to module;

“Default” button: Recover default value；

8. Ordering information

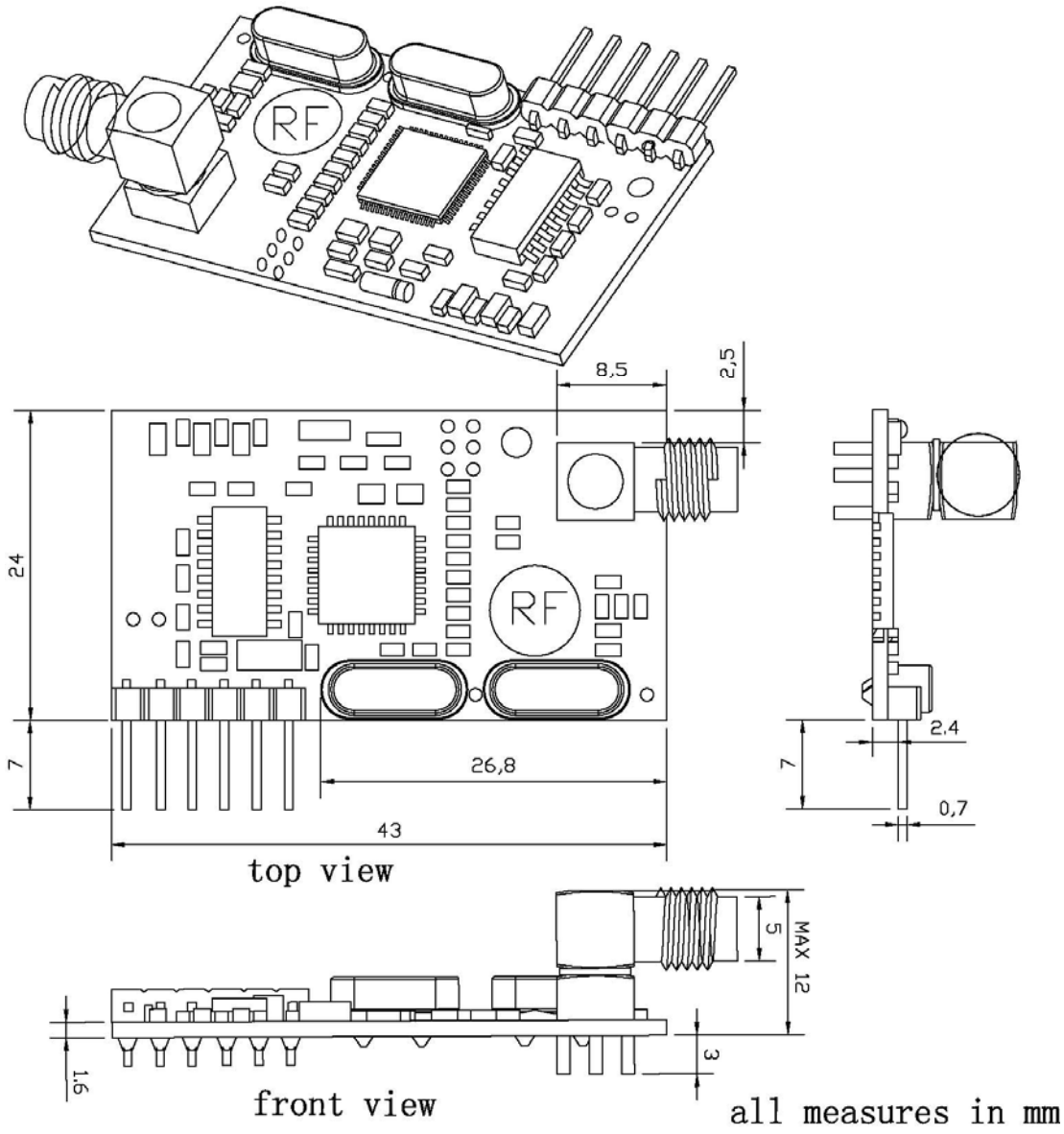
P/N	Logic Level
HM-TRxxx/TTL	TTL
HM-TRxxx/232	RS232

9. Module naming rule

HM-TR 315 / TTL

- TTL: Logic Level：TTL—TTL; 232—RS232
- 315: Work frequency：315Mhz—315MHz；433 Mhz—434MHz；868 Mhz—869MHz；915 Mhz—915MHz。
- TR: TX or RX：TR—TX and RX
- HM-TR: Family Code

10. Mechanical outline



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