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# TRM100 Wireless Data Transceiver Module

## User Manual

(Version: V1.0)

**Author:** Jinzhou Xin **Date:** 20150916

**reviewer:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**signer:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**approved:** \_\_\_\_\_ **Date:** \_\_\_\_\_



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**Guangzhou Goelectron Science & Technology Company Limited**

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## 1、 Technical specifications

Technical specifications		
Specification name	specification requirements	
Frequency rage	410~470MHz	
Working type	half-duplex	
Channel spacing	25KHz 12.5KHz	
Modulation type	GMSK	
Operating voltage	3.3V $\pm$ 10%( TX state, not more than 5 v)	
Power consumption	Transmitted power	3.3W
	Receive power	0.3W
Frequency stability	$\leq \pm 1.0$ ppm	
Size	70×47×9mm	
Weight	88g	
Operating temperature	-40~+85°C	
Storage temperature	-45~+90°C	
Antenna interface	IPX or MMCX	
Antenna impedance	50ohm	
Data interface	30pin 0.5mm	
Transmitter specification		
Specification name	specification requirements	
RF output power	High power ( 1.0W )	30dBm
RF power stability	$\pm 0.3$ dB	
Adjacent channel inhibition	>50dB	
Receiver specification		
Specification name	specification requirements	
Sensitivity	$10^{-5} \cdot 9600$ bps	
Co-channel inhibition	>-12dB	
Block	>70dB	
Adjacent channel selectivity	>52dB@25KHz	

perturbation resistance stray	>55dB
Modulator	
Specification name	Specification requirements
Air rate	9600bps
Modulation method	GMSK

## 2、 Definition of interface connector pin

Pin No.	Input/output	definition
1	Input/output	GND
2	NC	No connection
3	Input	RXD
4	NC	No connection
5	Input/output	GND
6	NC	No connection
7	Input/output	GND
8	NC	No connection
9	Input/output	GND
10	NC	No connection
11	Input	L:command configuration mode; M:data transmission mode
12	NC	No connection
13	NC	No connection
14	Output	TXD
15	NC	No connection
16	NC	No connection
17	NC	No connection
18	Input	VCC- +3.3 VDC
19	Input/output	GND
20	Input/output	GND
21	Input/output	GND
22	Input/output	GND
23	Input	VCC +3.3 VDC
24	Input	VCC +3.3 VDC
25	Input	VCC +3.3 VDC
26	Input	VCC +3.3 VDC
27	Input	VCC +3.3 VDC
28	Input	VCC +3.3 VDC
29	NC	No connection
30	Input/output	GND

### 3、Transceiver command instructions

#### 3.1 Serial port configuration in the factory state.

serial port baud rate setting	38400
Data bits	8
Stop bit	1
Check bit	none

#### 3.2 Basic command

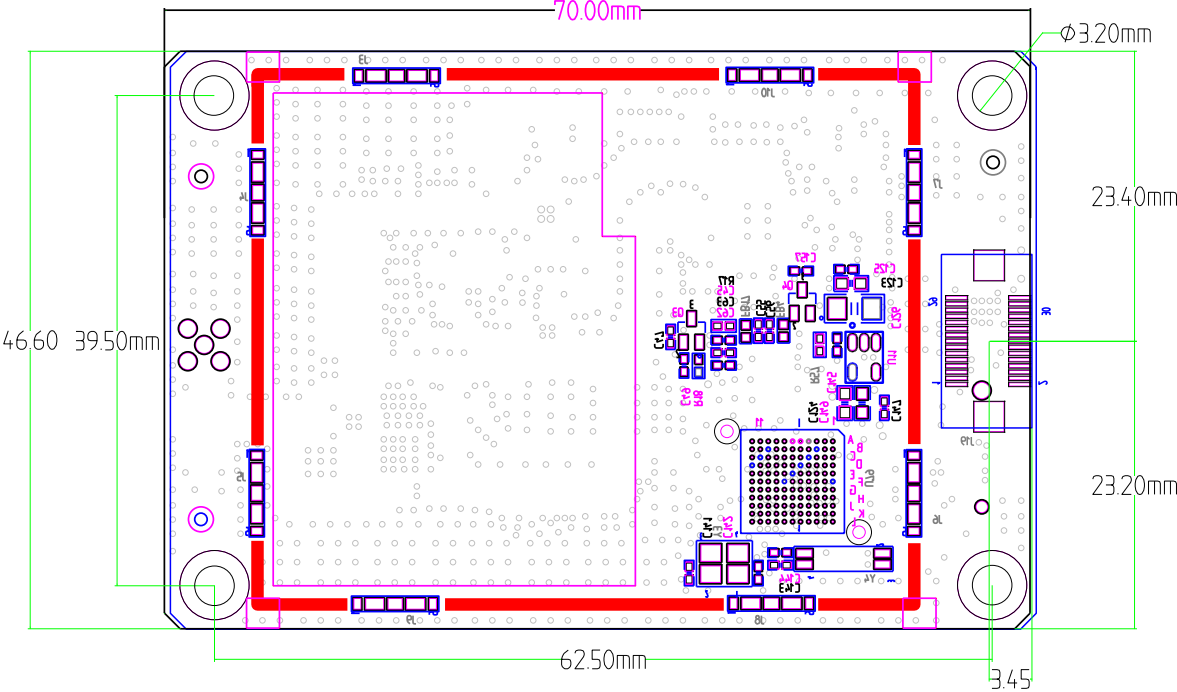
- 3.3.1 TX 【parameter】  
Function: set the transmission frequency (MHz)  
Parameter choice: 410.000 – 470.000  
Example: TX 466.125 show: “PROGRAMMED OK”
- 3.3.2 TX  
Function: query the transmission frequency  
Example: TX show: “TX 466.12500 MHz”
- 3.3.3 RX 【parameter】  
Function : set receive frequency (MHz)  
Parameter choice: 410.000 – 470.000  
Example: RX 466.125 show: “PROGRAMMED OK”
- 3.3.4 RX  
Function: query the receive frequency  
Example: RX show: “RX 466.12500 MHz”
- 3.3.5 BAUD 【parameter】  
Function : set air baud rate (bps)  
Parameter choice: 9600、19200  
Example : BAUD 9600 show: “PROGRAMMED OK”
- 3.3.6 BAUD  
Function : query the air baud rate (bps)  
Example : BAUD show: “BAUD 9600”
- 3.3.7 PWR 【parameter】  
Function: set the transmission power  
Parameter choice: H、L  
Example: PWR L show “PROGRAMMED OK”
- 3.3.8 PWR  
Function: query the transmission power  
Example: PWR show “PWR L”
- 3.3.9 CHANNEL 【parameter】  
Function: set the current channel  
Parameter choice: 0、1、2、3、4、5、6、7  
Example: CHANNEL 0 show “PROGRAMMED OK”
- 3.3.10 CHANNEL  
Function: query the current channel  
Example: CHANNEL show “CHANNEL 0”
- 3.3.11 PRT 【parameter】  
Function: set current protocol type  
Parameter choice: TRIMTALK、TRIMMK3、SOUTH

- 3.3.12 Example: PRT TRIMTALK show “PROGRAMMED OK”  
PRT  
Function: query current protocol type
- 3.3.13 Example: PRT show “PRT TRIMTALK”  
SREV  
Function: query current software version
- 3.3.14 Example: SREV show “GA0B11O12D15.09.12”  
SER 【parameter】  
Function: set the serial number  
Parameter choice: less than 16 numbers of ASCII  
Example: SER TRU201-006 show “PROGRAMMED OK”  
note: serial number is the only remark for the UHF, so it’s forbidden to change the serial number by software.
- 3.3.15 SER  
Function: query the serial number  
Example: SER show “SN:TRU201-006”  
note: if UHF has never set the SN with no.14 command, so only show the “SN:”
- 3.3.16 FLOW  
Function: query the lower limit of UHF frequency.  
Example: FLOW show “FLOW 410”
- 3.3.17 FUPP  
Function: query the upper limit of UHF frequency.  
Example: FUPP show “FUPP 470”
- 3.3.18 SBAUD 【parameter】  
Function: set baud rate of Communication interface.  
Parameter choice: 9600、19200、38400、57600、115200  
Example: SBAUD 38400 show “PROGRAMMED OK”
- 3.3.19 SBAUD  
Function: query baud rate of Communication interface.  
Example: SBAUD show “SBAUD 38400”

### 3.4 Special commands

- 3.4.1 CCA 【parameter】  
Function: query the received signal strength value (dBm )of the specified channel(MHz).  
Parameter choice: 410.000 – 470.000  
Example: CCA 466.125 show:  
1) CCA 【parameter 1】:【parameter 2】, Example “CCA 466.125:-106.125”, indicate the received signal strength value is 466.125MHz in the current channel.  
2) “CCA 466.125:ERROR”, indicate the test is failed. But it is not indicated that all the channels to be tested are applicable, but is only the failure for the test operation. Without connecting the antenna, or too closer to the emission source, etc. may lead to the test failure.
- 3.4.2 RSSI  
Function: query the received signal strength value.  
Example: RSSI show:  
1) RSSI indicate it doesn’t receive any data in the protocol, so it can’t show the received signal strength value.  
2) RSSI -52.478 -48.063, -52.478 (dBm)

4、 Size specification



## 5、 Photo



## 6、 FCC radiation exposure statement

This equipment complies with FCC radiation exposure limits set forth for an controlled environment.  
This equipment should be installed and operated with minimum distance 30cm between the radiator & your body.

Only service personnel have access to the programming capabilities.

The end users in all these cases must not be able to program the radios.

This Licensed transmitter is approved as a module for installation into the final devices providing this FCC criteria is met:

1. The final device is designed for mobile or fixed operation.
2. The maximum antenna gain to allow compliance with RF exposure requirement that is listed on the Grant of Certification must be followed.
3. If the label of the module is not visible on the final device, the final device should contain the following text: "Contains FCC ID:2ABNA-TRM100"



## 7. Installation of Radio

Figure 1 shown the installation dimension of data transceiver module, firmly fitted the module modem onto the mounting surface of user system by holes on radio modem 4 corners (no fasteners supplied).

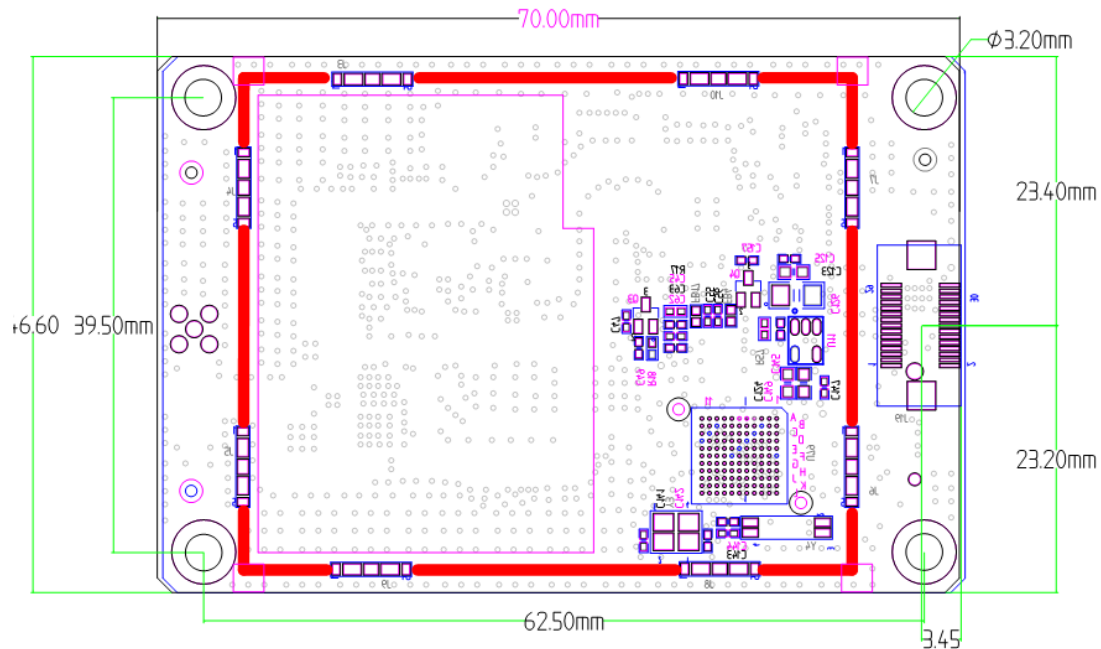


Figure 1

## Troubleshooting

Doing some simple checks in advance is a good habit, under normal operating conditions; the module modems must meet the basic requirements as below:

- Appropriate and stable power supply;
- Reliable connections (RF, data, power supply);
- Reasonably arranging the antenna system to achieve a good strength of receiving signal;
- The correct operating parameters of programmed radio modem (frequency, serial port baud rate, air baud rate, power level, protocol type, etc.);
- Interfaces of radio modem and data equipments connected correctly.

# SAFETY TRAINING INFORMATION

Your module generates RF electromagnetic energy during transmit mode. This module is designed for and classified as “Occupational Use Only”, meaning it must be used only during the course of employment by individuals aware of the hazards, and the ways to minimize such hazards. This module is NOT intended for use by the “General Population” in an uncontrolled environment.

This module has been evaluated for compliance at the distance of 30 cm with the FCC RF exposure limits for “Occupational Use Only”. In addition, your module complies with the following Standards and Guidelines with regard to RF energy and electromagnetic energy levels and evaluation of such levels for exposure to humans:

- FCC OET Bulletin 65 Edition 97-01 Supplement C, Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.
- American National Standards Institute (C95.1-1992), IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
- American National Standards Institute (C95.3-1992), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields– RF and Microwave.
- The following accessories are authorized for use with this product. Use of accessories other than those specified may result in RF exposure levels exceeding the FCC requirements for wireless RF exposure



**To ensure that your exposure to RF electromagnetic energy is within the FCC allowable limits for occupational use, always adhere to the following guidelines:**

DO NOT operate the module without a proper antenna attached, as this may damage the module and may also cause you to exceed FCC RF exposure limits. A proper antenna is the antenna supplied with this module by the manufacturer or antenna specifically authorized by the manufacturer for use with this module.

- DO NOT transmit for more than 50% of total radio use time (“50% duty cycle”). Transmitting more than 50% of the time can cause FCC RF exposure compliance requirements to be exceeded.

## **Electromagnetic Interference/Compatibility**

During transmissions, your module generates RF energy that can possibly cause interference with other devices or systems. To avoid such interference, turn off the module in areas where signs are posted to do so. DO NOT operate the transmitter in areas that are sensitive to electromagnetic radiation such as hospitals and blasting sites.

## **Occupational/Controlled Use**

The module transmitter is used in situations in which persons are exposed as consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure.

This device is to be used in mobile or fixed applications only. Antenna gain including cable loss must not exceed 4.79 dBi for the purpose of satisfying the requirements of 2.1043 and 2.1091. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 30cm from all persons and must not be co-located or operated in conjunction with any antenna or transmitter not described under this FCC ID. The final product operating with this transmitter must include operating instructions and antenna installation instructions, for end-users and installers to satisfy RF exposure compliance requirements. Compliance of this device in all final product configurations is the responsibility of the Grantee. Installation of this device into specific final products may require the submission of a Class II permissive change application containing data pertinent to RF Exposure, spurious emissions, ERP/EIRP, and host/module authentication, or new application if appropriate. Installation of this device into specific final products may require the submission of a Class II permissive change application containing data pertinent to RF Exposure, spurious emissions, ERP/EIRP, and host/module authentication, or new application if appropriate.