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TRM101 Wireless Data Transceiver Module

User Manual

（Version：V1.0）

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 Geoelectron

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Catalog

1、 Technical specifications

Technical specifications		
Specification name	specification requirements	
Frequency rage	410~470MHz	
Working type	half-duplex	
Channel spacing	12.5KHz / 25KHz	
Modulation type	GMSK	
Operating voltage	3.3V ±10%(TX state, not more than 4V)	
Power consumption	Transmitted power	3.3W
	Receive power	0.48W
Frequency stability	≤±1.0ppm	
Size	57×36×7mm	
Weight	66g	
Operating temperature	-40~+85℃	
Storage temperature	-45~+90℃	
Antenna interface	IPX or MMCX	
Antenna impedance	50ohm	
Data interface	20pin	
Transmitter specification		
Specification name	specification requirements	
RF output power	High power （1.0W）	
RF power stability	±1.0dB	
Adjacent channel inhibition	>50dB	
Receiver specification		
Specification name	specification requirements	
Sensitivity	Better than -115dBm@BER 10^{-5} ，9600bps	
Co-channel inhibition	>-12dB	
Block	>70dB	
Adjacent channel selectivity	>52dB@25KHz	

perturbation resistance stray	>55dB
Modulator	
Specification name	Specification requirements
Air rate	9600bps,19200 bps
Modulation method	GMSK

2、Definition of interface connector pin

Pin No.	Input/output	definition
1	Input	VCC
2	Input	VCC
3	Input/output	GND
4	Input/output	GND
5	NC	No use
6	Input	Enable
7	Output	RXD
8	NC	No use
9	Input	TXD
10	NC	No use
11	NC	No use
12	NC	No use
13	NC	No use
14	NC	No use
15	NC	No use
16	NC	No use
17	Input	Config
18	NC	No use
19	NC	No use
20	NC	No use

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

Example：PRT TRIMTALK　　　show“PROGRAMMED OK”

3.3.12　PRT

Function：Query current protocol type

Example：PRT　　　show“PRT TRIMTALK”

3.3.13　SREV

Function：Query current software version

Example：SREV　　　show“GA0B11O12D15.09.12”

3.3.14　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、Installation of radio

Figure 1 shown the installation dimension of data transceiver module, firmly fitted the radio modem onto the mounting surface of user system by holes on radio modem 4 corners。
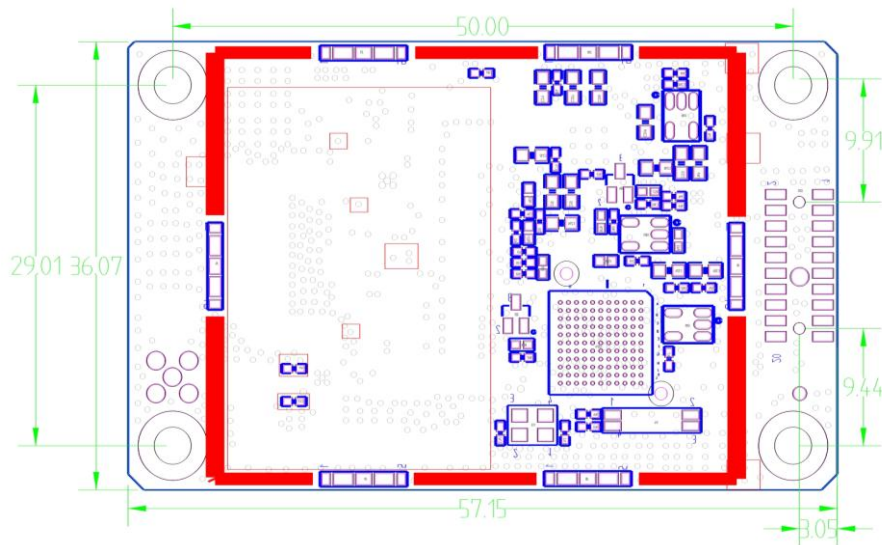
Figure 1 Radio Modem installation dimension

5 Main Power Supply

TRM101 can operate with any 3.3V power supply, which comes from data interface connector with good filtered. The power must supply 1A current at least and featured with current-limiting, even if you make radio modem operating on low power mode

6 Warning

This device complies with part 15of the FCC rules.

Operation is subject to the condition that this device does not cause harmful interference.

7、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 60cm 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-TRM101"

8、Photo

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-- Consult the dealer or an experienced radio/TV technician for help.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique
à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour
fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste,
ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur