Switch Value Output of TFmini Plus

1 Introduction

For the performance and considerations of TFmini Plus, please refer to the corresponding specifications and manual. This manual is only a reference for modifying the TFmini Plus to a switch value signal output. The switch value here is the active signal (step signal) 0 or 1. **The corresponding voltage of 0 is 0V and that of 1 is 3.3V.**

2 Line Sequence

The TFmini Plus has four connection lines, which are 5V power line, GND, receive line (RXD), and transmit line (TXD). The switch value signal is given by the transmit line (TXD) and forms a reference voltage with GND.

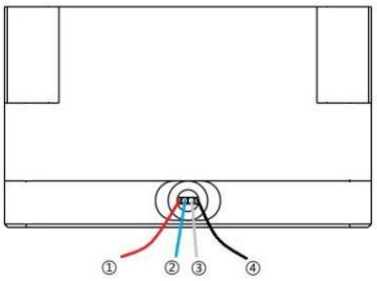


Table5: The Function and Connection Description of each pin

No.	Color	PIN	Funciton	Comment
①	red	+5V	Power supply	Positive
②	blue	TXD	Transmitting	High and low level detection
③	White	RXD	Receiving	
④	Black	GND	Ground	Ground

TFmini Plus has a 30cm long connecting wire with a GH1.25-4P (Molex51021-0400) connector. The connecting wire can be extended as needs. To ensure effective data transmission, the length of connecting wire should be short than 1m.

3 Judgment Logic and Signal Output of TFmini-Plus Switch Value

Assuming that the TFmini Plus detection threshold is 2m. When the measurement value of TFmini-Plus is less than 2m , in other words, there is an object within 2m in front of TFmini Plus, the TXD output is high level (3.3V); and when the measurement value of TFmini-Plus is beyond 2m , the TXD output is low level (0V).

Ps: The level is relative to GND. Please pay attention to be common-ground before measuring.

4 Modification of the Switch Value Threshold

The measurement threshold can be modified by the TFmini Plus through serial commands. The steps are as follows.

4.1 Required Tools of Product Test

					
TFmini Plus	wires	TTL – USB board	USB	computer	Serial assistant

4.2 Test Procedures

Fig.2 Correct Connection

Connect “TFmini Plus”, “TTL - USB board” and “USB cable” as shown in Figure 2. Make sure there is no loose connection. Then connect “USB cable” with “PC”.

Please download "serial assistant sscom5.12.exe" to send commands to radar.

Open the SSCOM, the interface is as follows:

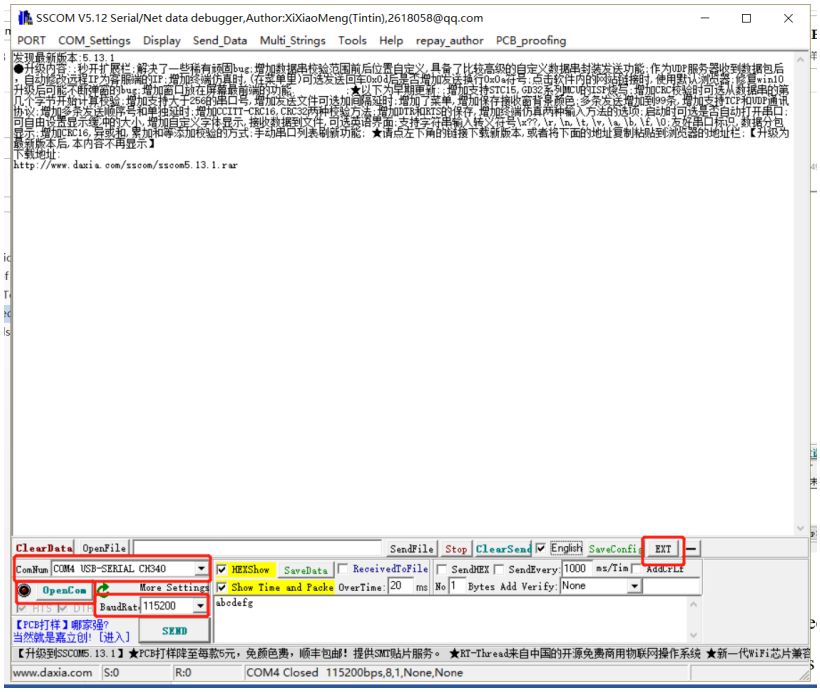
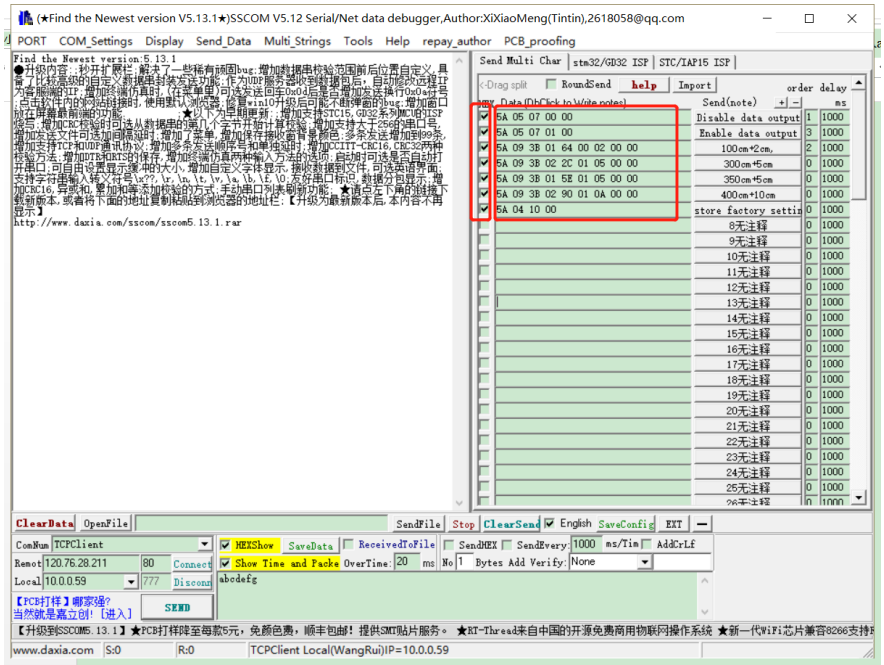


Fig.3 Serial assistant SSCOM

Select the port which the radar is connected, and check “Open Serial Port”, confirm the baud rate is 115200. Then click the [Extension], and displayed as follows:



Fill in commands in this blank position (the commands refer to Chapter 4.3) and check HEX.

When you need to send a command, click the button on the right side of it, as shown below:

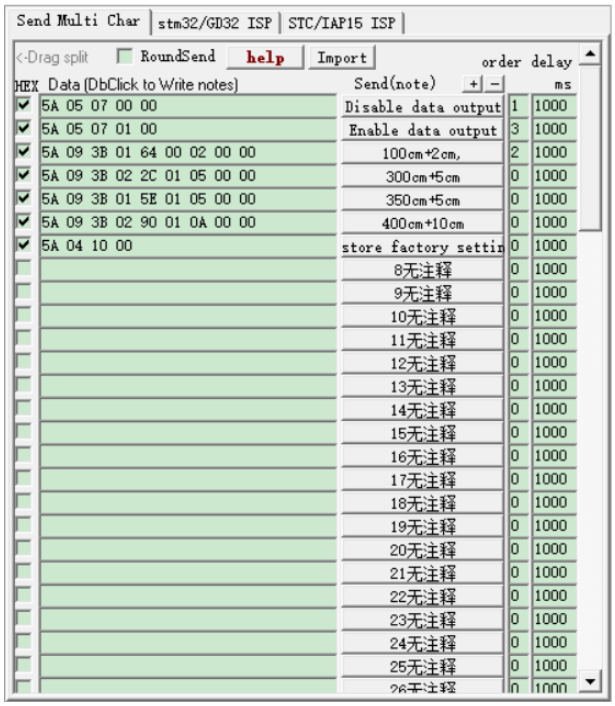


Fig.5 send commands

4.3 Commands Configuration and Description

1. 【Disable data output】Turn off the input and output enable of TFmini-Plus, stop the measurement program to prevent program conflicts when modifying the configuration.
   - Command: 5A 05 07 00
2. 【Setting output mode of switch value】
   - Switch value mode, critical value and hysteresis range should be set for switch value.
   - Switch value mode： When it is below the threshold, the output level is high/low, and when it is above the threshold, the output level is low/high.
   - Critical value: the threshold for switching between high and low levels
   - Hysteretic range: Assuming that the critical value is 100 cm and the hysteretic range is 2 cm, it means that the output state does not change within 100-102 cm: ① the original state is close-distance, and when the measurement distance > 102cm, the

output state changes to long-distance state; ②the original state is long-distance state, and when the measurement distance < 100 cm, the output state changes to close-distance state.

- Command: 5A 09 3B EE FF GG HH KK 00. Among them, EE FF GG HH KK needs to be modified.
  - EE：Switch value mode. 00 is the close switch value mode, 01 is the near-high-far-low level switch value mode, 02 is the near-low-far-high level switch value mode.
  - FF GG：Critical value. FF is the critical value low 8 bits, GG is the critical value high 8 bits. For example, the critical value is 500 cm, the HEX is 01F4, and the corresponding FF GG is F4 01.
  - HH KK：Hysteretic range. HH is the hysteretic range low 8 bits，KK is the hysteretic range high 8 bits. For example, the hysteretic range is 10 cm, the HEX is 000A, and the corresponding HH KK is 0A 00.
- Examples：
  - threshold is 100cm, hysteresis range is 2cm(When the threshold < 100, the output level is high; and when the threshold > 100, the output level is low.)

    the command is:

    5A 09 3B 01 64 00 02 00 00
  - threshold is 300cm, hysteresis range is 5cm, (When the threshold < 100, the output level is low; and when the threshold > 100, the output level is high.)

    the command is:

    5A 09 3B 02 2C 01 05 00 00
  - threshold is 350cm, hysteresis range is 5cm (When the threshold < 100, the

output level is high; and when the threshold > 100, the output level is low.)

the command is:

5A 09 3B 01 5E 01 05 00 00

- threshold is 400cm, hysteresis range is 10cm (When the threshold < 100, the output level is low; and when the threshold > 100, the output level is high.)

the command is:

5A 09 3B 02 90 01 0A 00 00

3. 【Enable data output】Turn on the output enable of the TFmini-Plus to start measuring after the switch value mode is set up. The command is: 5A 05 07 01 00.
4. 【Restore factory settings (if necessary)】command：5A 04 10 00