TSR20 Speed Sign Radar
User Manual V1.0.5

1. Technical Parameter

Parameter	Condition	MIN	TYP	MAX	UNIT
System Characteristics					
Transmit frequency		24	24.15		GHz
Response time	adjustable	50	500	2000	ms
Tolerance of Transmit frequency		-45		45	MHz
Power			1.6		W
Communication interface		RS485/RS232/wifi/high low level			
Distance measurement/Speed measurement characteristic					
Speed range		5		300	km/h
Speed accuracy		-1		0	km/h
Direction		Closing/leaving direction distinguish			
Distance range		200		300	m
Antenna Characteristics					
Beam Width /TX	Azimuth(-6dB)		56.7		deg
Beam Width /TX	Elevation(-6dB)		28		deg
Other Characteristics					
Working Voltage		6	12	16	V DC
Working Current			0.13		A
Working Temperature		-40		85	℃
Working Humidity		5%		95%	RH
Size		105×85×13			mm

2. Pin out instruction

Colour	Description	Remark
Red	DC12V	Power supply (+)
Black	GND	Power supply (-)
Purple	RS485+	The front end of receiving and transmit differential signals (+)
Orange	RS485-	The negative end of receiving and sending differential signals (-)
Blue	RS232 TX	Transmit
Yellow	RS232 RX	Receive
Green	GND	Signal ground
Brown	Digital output	Default open; it will close if the target speed is lower than low speed limits
White		

3. Radar Installation

横装   竖装
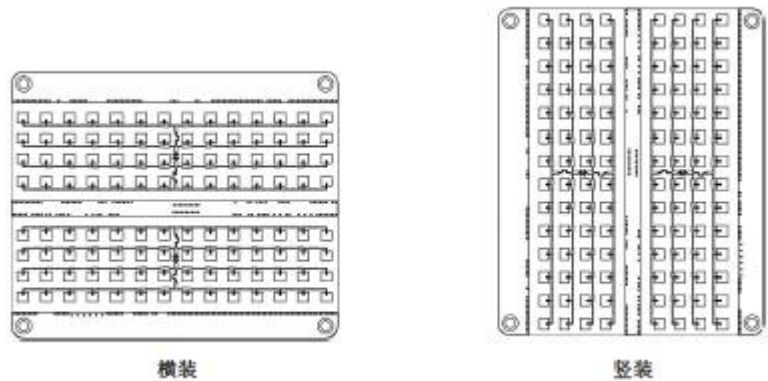
Crosswise   installation   Lengthwise Installation

Note: The suggested installation is install it horizontally, fov is 6.7 degree, if install it verticlaly, the fov is 28 degree.

4. Parameter Configuration

4.1 Connect Radar

To connect the radar RS232 interface with PC software via a USB-RS232 cable, start the software, and

select the corresponding serial port number, then click "connect the device", show as figure 1.
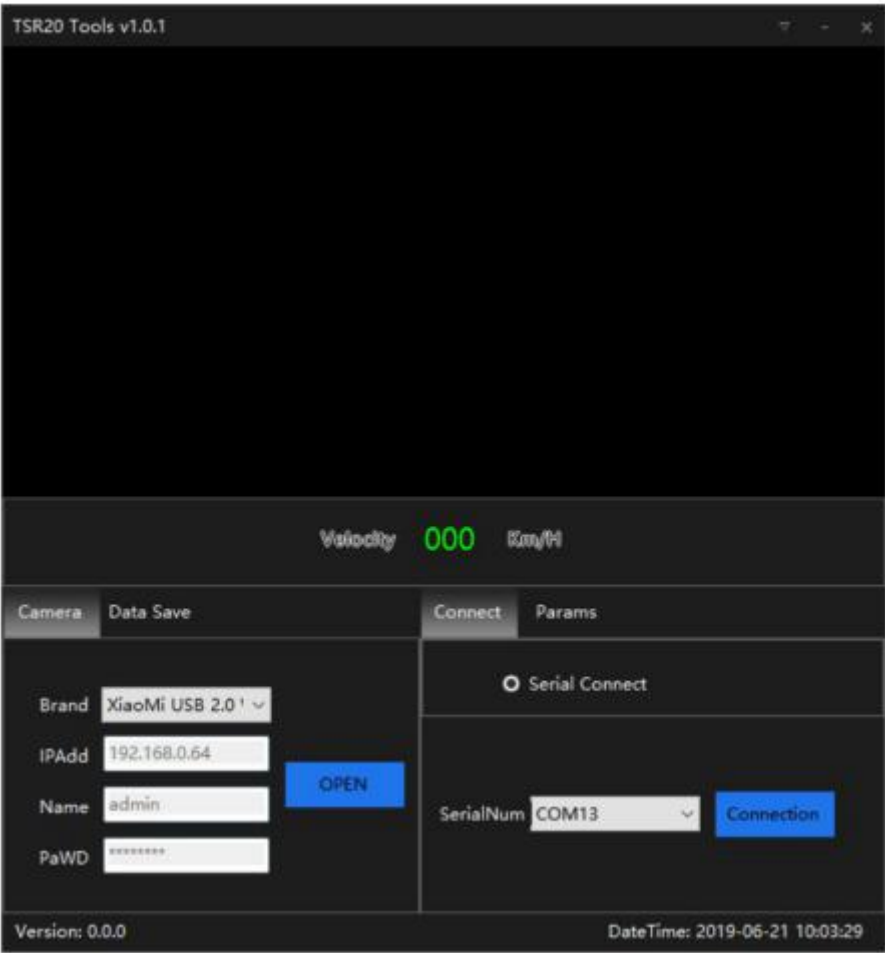

Figure 1　serial port connection

4.2 Sensitivity

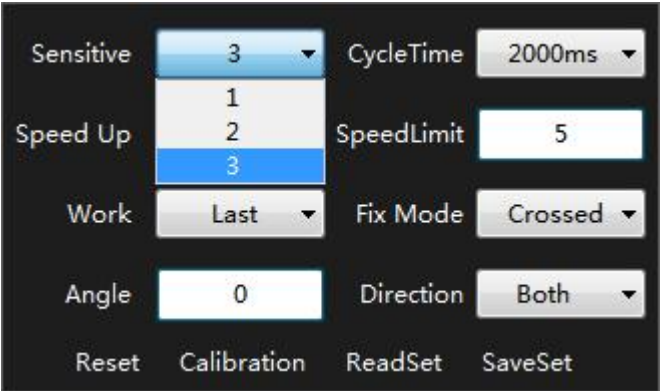Sensitivity: the low sensitivity is level 1,　the maximun sensitivity is level 3.

Figure 2　Sensitivity

4.3 Response Time

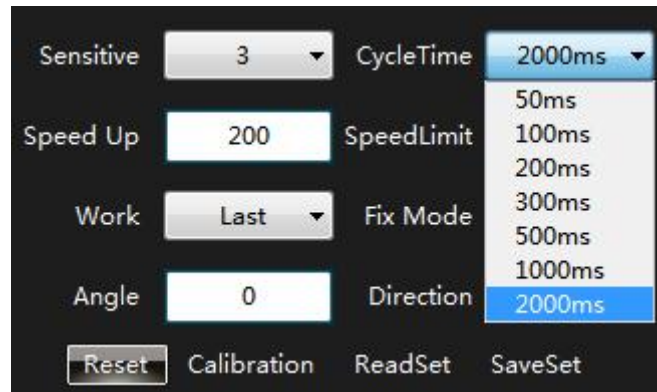Setting for time interval of data output.

Figure 3   response time

4.4 Work Mode

Touch : the target is always in the radar coverage area (the trajectory is continuous), the radar continuously outputs the first frame speed data of the target.

Last :the target is always within the radar coverage area (the trajectory is continuous). As long as the speed changes, the radar continues to output at the changed speed data.

Figure 4   Work Mode(signal output mode)

4.5 Setting Speed Measurement Limit

When the object speed is lower than speed lower limits value, radar will not output the object speed value. The radar will only output the speed value when the object speed is higher than the speed lower limits and lower than the speed upper limits.

Figure 5   Speed Measurement Limit

4.6 Installation Angle

The angle compensation between the center of the radar beam axis and the movement of the moving target (car).

Figure   Installation Angle

4.7 Detection Direction

Coming: car head end trigger mode;

Leaving : car tail end trigger mode;

Both: coming car head end and leaving car tail end trigger mode

Figure7　Detection direction

5.　Protocol Analysis

RS485 serial port, baud rate default 9600, no check bit, 8 is data bit, 1 is stop bit.

Coming target speed data: 0XFC 0XFA sum 0x00

Leaving target speed data: 0XFB 0XFD sum 0x00

Note: sum is the speed value data, the range is 0X01-0XFA (corresponding speed range is 1km / h ～ 250km / h)