A19 Module Output Interface

01 — PWM Controlled output

02 — UART Auto output

03 — UART Controlled output

04 — Switch output
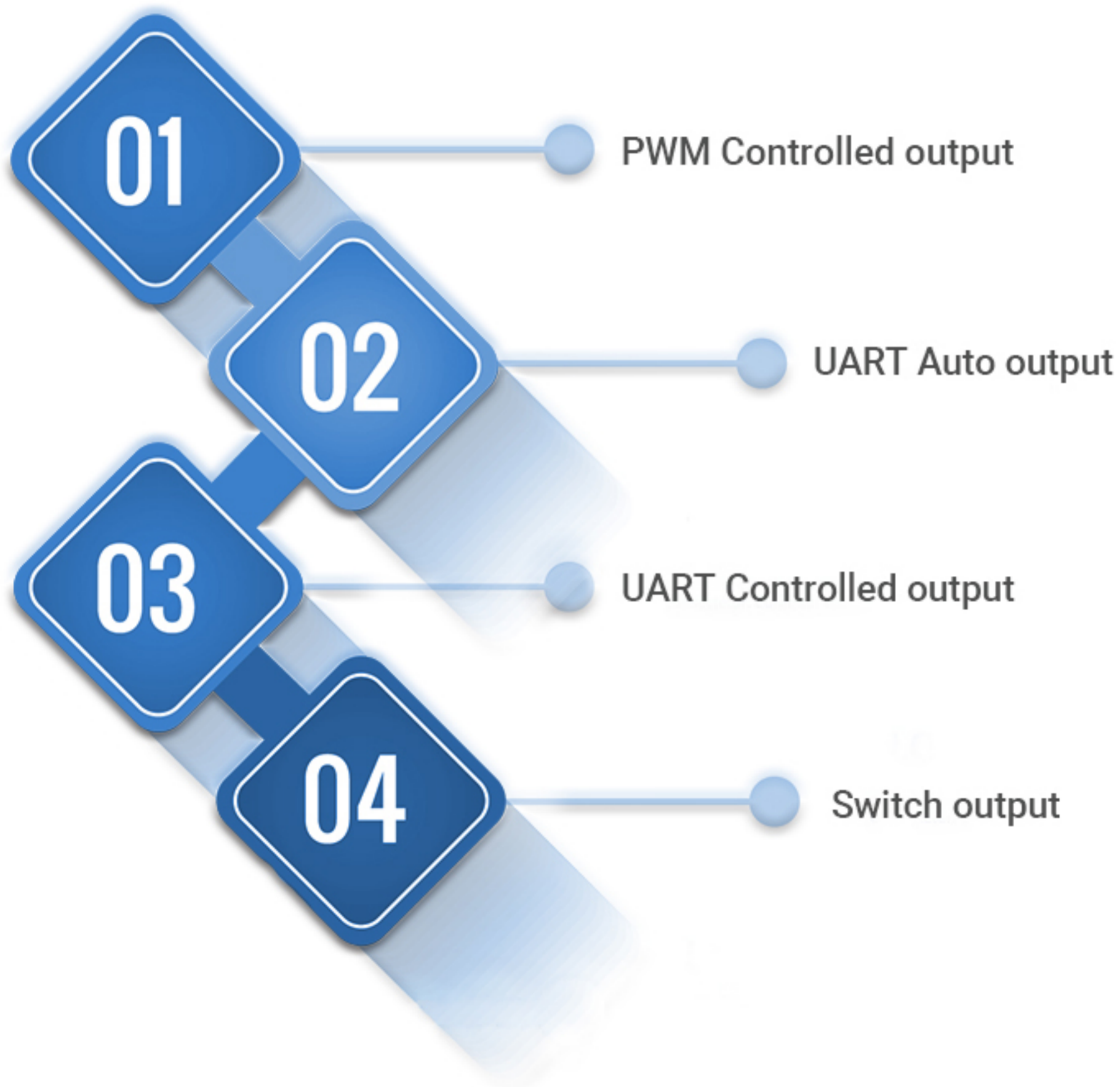
1. DYP-A19NYMW PWM Controlled output

(1) Pin definition

| Pin No.	Mark	Pin description	Remark
①	VCC	Power input	
②	GND	GND	
③	RX	Trigger input	
④	TX	PWM output	

Note:

C.The pin function setting followed customer's order, can't coexist with other output modes.

D.Pin RX and TX maximum allowable voltage is 5V

(2) Instruction

The Pin(RX) of module receives a falling edge signal, the module will perform a measurement, and pin(TX) will output a TTL level PWM high-level pulse width signal. The trigger period of the module must be greater than 70ms. If the module does not detect an object, the pin(TX)will output a fixed pulse width of about 35ms. If the module detects an object in the blind zone, the pin(TX)will output a fixed pulse width of 1.61ms or about 50ms.

(3) Timing Diagram
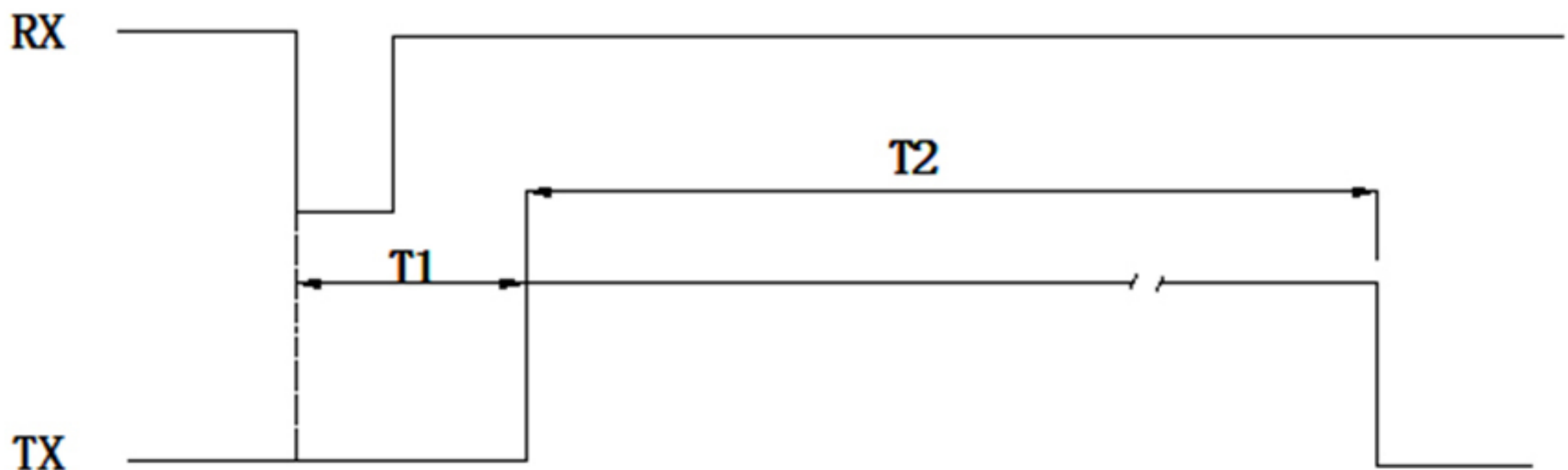
Remark:

T1=6～9ms,T2=1.62～35ms（Timing of PWM High-level pulse width）

T2≤1.61ms or T2=50ms, An object is detected in the blind area.

(4) Formula

Formula: S=T*V/2 (S is the distance value, T is duration time of PWM high-level pulse width, the V is sound travel speed in the air). V is directly calculated at speed of 348m/S at room temperature. The simplified formula is S= T/57.5 (unit of S in centimeters and us of time T)

For example: The duration time(T3) of PWM high-level pulse width is 10000us, the S= T/57.5=10000/57.5≈173.9(cm), means 173.9cm distance value.

2. DYP-A19NYUW UART Auto Output

(1) Pin Definition

Pin No.	Mark	Pin description	Remark
①	VCC	Power input	
②	GND	GND	
③	RX	Process value and Real-time value output	
④	TX	UART output	

Note:

E.The pin function setting followed customer's order, can't coexist with other output modes.

F.Pin RX and TX maximum allowable voltage is 5V

(2) UART Communication Instruction

Module will detect Pin(RX) when powered on. The module will output processed value when pin(RX) is suspended or input high level, the data is more stable, and the response time is 500ms. Module outputs real-time value when pin(RX) is input low power, the response time is 100ms. (The detection time of pin(RX)about 1 second. When using real-time value output, it is recommended to connect the pin(RX)to the low level before supplying power to the module)

Interface	Data Bit	Stop Bit	Parity Bit	Baud Rate
TTL level	8	1	N/A	9600bps

(3) UART Output format

Data Frame	Description	Byte
Start Bit	0XFF 0XFF	1byte
Data_H	High8 distance value	1byte
Data_L	Low8 distance value	1byte
SUM	Parity sum	1byte

(4) UART Output format Example

Start Bit	Data_H	Data_L	SUM
0XFF	0X07	0XA1	0XA7

Remark: Parity sum only remain low8 value.

SUM =(start bit+ Data_H+ Data_L)&0x00FF

=(0XFF + 0X07 + 0XA1)&0x00FF

=0XA7

Distance value= Data_H*256+ Data_L=0X07A1;

Convert to decimal equal to 1953

Means current measurement distance value is 1953mm

3. DYP-A19NYTW UART Controlled Output

(1) Pin Definitione

Pin No.	Mark	Pin description	Remark
①	VCC	Power input	
②	GND	GND	
③	RX	Trigger Signal input	
④	TX	UART output	

Note:

E.The pin function setting followed customer's order, can't coexist with other output modes.

F.Pin RX and TX maximum allowable voltage is 5V

(2) UART Instruction

When pin(RX) of the module receives a falling edge signal, the module will perform a measurement, and the measured distance value will be output on pin(TX) after each measurement is completed. This output mode can control the measurement cycle and reduce power consumption.

UART	Data Bit	Stop Bit	Parity Bit	Baud Rate
TTL level	8	1		9600bps

(3) Timing Diagram
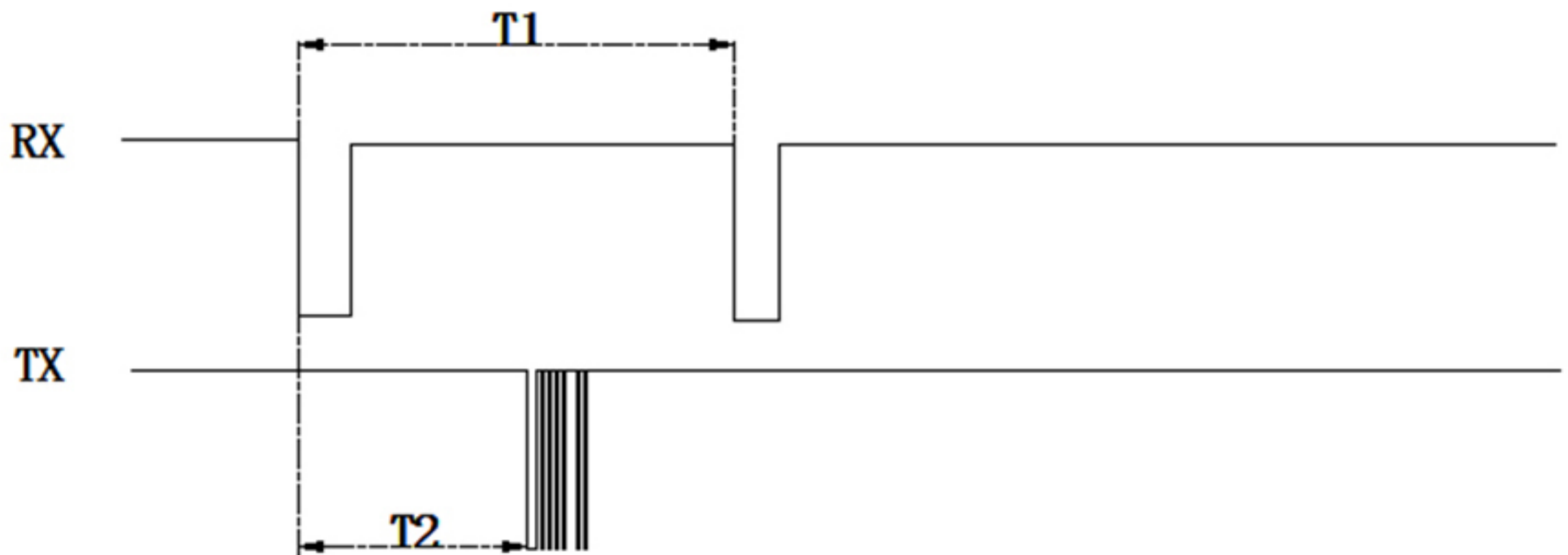
Remark:T1 ≥70ms, T2=40~50ms

(4) UART Output Format

Data Frame	Description	Byte
Start Bit	0XFF 0XFF	1byte
Data_H	High8 distance value	1byte
Data_L	Low8 distance value	1byte
SUM	Parity sum	1byte

(5) Example

Start Bit	Data_H	Data_L	SUM
0XFF	0X07	0XA1	0XA7

Remark: Parity sum only remain low8 value.

SUM =(Start Bit+ Data_H+ Data_L)&0x00FF

=(0XFF + 0X07 + 0XA1)&0x00FF

=0XA7

Distance value= Data_H*256+ Data_L=0X07A1

Converts to decimal equal to 1953, means current measurement distance value is 1953mm

4. DYP-A19NYGDW Switch Output

(1) Pin Definition

Pin No.	Mark	Pin description	Remark
①	VCC	Power input	
②	GND	GND	
③	RX	Trigger Signal input	
④	TX	UART output	

Note:

The pin function setting followed customer's order, can't coexist with other output modes.

Pin RX and TX maximum allowable voltage is 5V

(2) Instruction

The pin(TX) will output the corresponding set level (default high level) when the module detects an object in the sensing area, will output the corresponding set voltage level (default low level)if the module does not detect an object. The output of the module is only high and low level signals, without driving capability.

Module will detect Pin(RX) when powered on. The module will output processed value when pin(RX) is suspended or input high level, the data is more stable, and the response time is 500ms. Module outputs real-time value when pin(RX) is input low power, the response time is 100ms. (The detection time of pin(RX)about 1 second. When using real-time value output, it is recommended to connect the pin(RX)to the low level before supplying power to the module)

(3) Default setting

① In order to improve the stability, default timing is about 500ms of output level when an object is sensed.

② Default thresholds is 100cm. It can be set through the UART serial port, range is 28~450cm.

③ Pin(TX) output high level when there is an object detected in the sensing area, output low level when there is no object detected. It can be set through the UART serial port.

(4) Serial Setting

In order to flexibly adjust the thresholds, the module adds the function of modifying the thresholds through the serial port command.

UART	Data Bit	Stop Bit	Parity Bit	Baud Rate
TTL level	8	1		9600bps

(5) Modify thresholds data format

Sensor module as slave. Customer device as master.

Master Request

Name	Start Bit	Command code	Threshold high value	Threshold low value	Parity Sum
Byte	0XFB 0XFB	0X05 0X05	1 Byte	1 Byte	1 Byte

Slave response

Name	Start Bit	Command code	Threshold high value	Threshold low value	Reserved	Parity Sum
Byte	0XFB 0XFB	0X05 0X05	1 Byte	1 Byte	0X00	1 Byte

Remark: Parity Sum=(Start bit+command code+Threshold high value+threshold low value)&0x00FF

Example 1

Master:FB 05 03 E8 EB （Parity Sum=(0XFB+0X05+0X03+0XE8)&0X00FF=0XEB）

Salve:FB 85 03 E8 00 6B

It means that the setting is successful, and the switch distance is set to 1000mm.

Threshold value range 28-450cm

(6) Switch polarity data format

Sensor module as slave. Customer device as master.

Master Request

Name	Start Bit	Command Code	Reserved	Output Polarity	Parity Sum
Byte	0XFB 0XFB	0X06 0X06	0X00	High Level:0X01 Low Level :0X00	1Byte

Slave Response

Name	Start Bit	Command code	Reserved	Output Polarity	Reserved	Parity Sum
Byte	0XFB 0XFB	0X06 0X06	0X00	High Level :0X01 Low Level :0X00	0X00	1 Byte

Note: Parity Sum=(Start Bit+command code+ output polarity)&0x00FF

Example 1

Master:FB 06 00 01 02 （Parity Sum=(0XFB+0X06+0X00+0X01)&0X00FF=0X02）

Slave:FB 86 00 01 00 82

It means setting is successful, Pin(TX)of module output high level when detect an object.

Example 2

Master:FB 06 00 00 01 （Parity Sum=(0XFB+0X06+0X00+0X00)&0X00FF=0X01）

Slave:FB 86 00 00 00 81

It means setting is successful,Pin(TX)of module output low level when detect an object.