

SENTEST communication protocol

SENTEST infrared thermometer uses asynchronous serial communication.

1 Serial interface parameters

Baud rate: 9600 to 115200
Data bits: 8
Parity: none
Stop bits: 1

2 Protocol

SENTEST infrared thermometer uses a binary communication protocol. Each command starts with a command byte, then follows the data (no data for read command), and the last byte is the checksum to verify that the communication is correct. The checksum is the XOR result of all previous bytes. The instrument will return the values or settings, and ends with a checksum.

For RS485 communication, each command starts with 2 address bytes first, from FF01hex ~ FFFEhex, next the third byte command byte, afterwards the data (no data for read command), and the last byte is the checksum to verify that the communication is correct. The checksum is the XOR result of all previous bytes. The instrument will return address, the values or settings, and ends with a checksum.

Example:

Read temperature of target:

Send: 01hex (01hex) Return: 04hex D3hex (D7hex)

Set emissivity to 0.950:

Send: A0hex 03hex B6hex (15hex) Return: 03hex B6hex (B5hex)

RS485 mode : Read temperature of target of FF 05 :

Send: FFhex 05hex 01hex (FBhex) Return: FFhex 05hex 04hex

This is checksum inside the ()

3 Data format

All data more than one byte is divided into several bytes, high byte in the front.

Data	bytes	means	example	Remark
Temperature	2	$(\text{byte1} \times 256 + \text{byte2} - 1000) / 10$	04 D3 --> =(04D3hex-1000)/10 =(1235-1000)/10 =23.5°C	the unit is °C
Emissivity	2	$(\text{byte1} \times 256 + \text{byte2}) / 1000$	03 B6 --> =03B6hex/1000 =950/1000 =0.950	
Hold Time	2	$(\text{byte1} \times 256 + \text{byte2}) / 10$	00 C8 --> =00C8hex/10 =200/10 =20	the unit is second

4 Command list (Enable modification parameters: Send: fd 01 fc Expected Response: 01 01 (indicating completion))

Function	Command		Data bytes	Unit	Remark
	Read	Write			
Parameter					
Emissivity	20	A0	2		(Default 0.95 or 1.0)
Address	41	C1	2		FF01-FFFE (For RS485 mode only, Default FF01)
Baud rate	43	C3	1		0--1200 1--2400 2--4800 3--9600 4--19200 5--38400 6--57600 7-115200
Low end for output	44	C4	2	°C	e.g.xxx°C
High end for output	45	C5	2	°C	e.g.xxxx°C
Hold mode	47	C7	1		0--Real mode 1--Peak Hold 2--Valley Hold 3--Advanced peak hold

Average time	48	C8	2	S	
Peak hold time	49	C9	2	S	
Valley hold time	4A	CA	2	S	
Advanced peak hold threshold	4D	CD	2	°C	
Backlight	54	D4	1		1 : On, 0 : Off
Laser	55	D5	1		1 : On, 0 : Off
Data					Read Only
Tobj	01	--	2	°C	Temperature of target
Control					
Restore factory settings	--	64	1		return:E4hex

5 Examples

Commands	Send	Receive	
Reading target temperature	01 [01]	04 D3 [D7]	$(04D3\text{hex} - 1000)/10 = (1235 - 1000)/10 = 23.5^{\circ}\text{C}$
Reading unit with address FF05 target temperature	FF 05 01 [FB]	FF 05 04 D3 [2D]	$(04D3\text{hex} - 1000)/10 = (1235 - 1000)/10 = 23.5^{\circ}\text{C}$
Reading unit with address FF05 emissivity	FF 05 20 [DA]	FF 05 03 B6 [4F]	$03B6\text{hex}/1000 = 950/1000 = 0.950$
Setting unit with address FF05 emissivity to 0.95	FF 05 A0 03 B6 [EF]	FF 05 03 B6 [4F]	