西安凯兴物联科技股份有限公司 Xi'an Kacise Optronics Tech Co., Ltd After-sales Problem Solving Report

Bugs level	Description	Note
Suggestive issue	Does not affect the performance and	
	use of the product, but acceptable	
	optimization and improvement.	
General issue	Does not affect the performance of the	
	product, the product under pressure or	
	extreme state of the performance of the	
	occasional problems	
Serious problem	Probabilistic issues affecting use	
Fatal problem	The inevitable problem that affects the	
	use	

Item	Description	Note
Issue tracking KUS550 Ultrasonic Level Sensor_2022_ 10_12_KH8002209290527_Suggestive		
No.	defects	
Issue description	The interval between two message frames of KUS550 ultrasonic level sensor is less than the requirement of Modbus protocol in RTU mode, which the message frames must be distinguished by an idle interval of at least 3.5 characters.	
Solution	In order to meet the requirements of Modbus protocol, the frame interval of KUS550 ultrasonic level sensor is extended at different baud rates.	

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The products affected by this change are KUS550 ultrasonic level sensor

Related products are KUS600 ultrasonic level sensor, KUS630 ultrasonic level sensor, KUS550L low power consumption ultrasonic ranging sensor, KSLV605 Capacitive Level Sensor

The protocol used is RS485 (<u>https://www.detailedp</u> <u>edia.com/wiki-RS-485</u>) 与 Modbus Protocol interface (<u>https://www.detailedpedia.com/wiki-Modbus</u>)_6.1 Modbus RTU frame format

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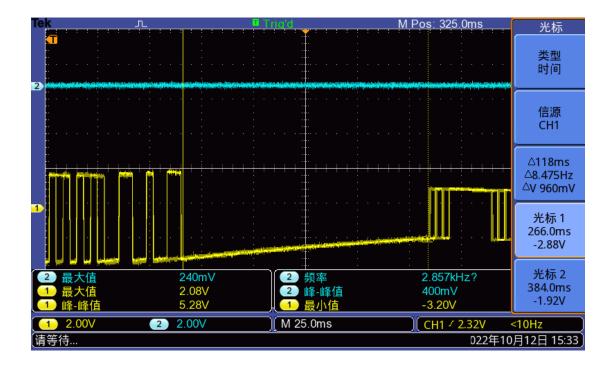
The code length time for different baud rates

is calculated as follow:

Baud rate	Code length (ms) 35bit for
Dauu Tale	one frame of data
300	116.667
600	58.334
1200	29.167
2400	14.584
4800	7.294
9600	3.646
19200	1.823
38400	0.912
57600	0.608
115200	0.304

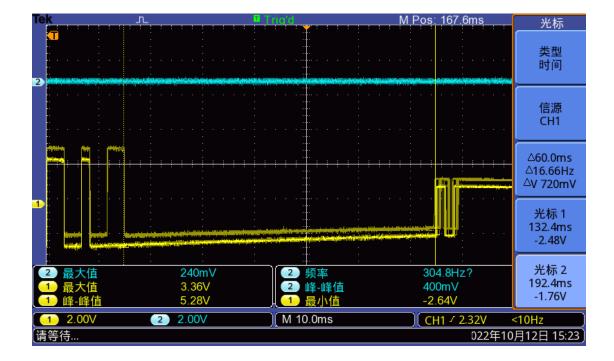
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The test results of each baud rate of KUS550 ultrasonic level sensor after code merge are as follows:



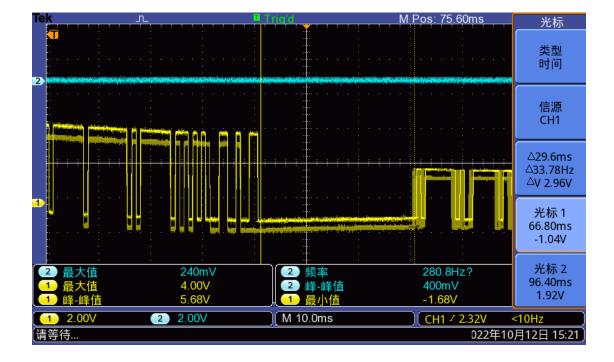
Test case number	Test result	Test conclusion
01	At 300 baud rates, after a long-time long afterglow test of oscilloscope, the interval between framer is designed to be 118ms, which meets the requirement of Modbus protocol greater than 116.667ms	OK

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Test case number	Test result	Test conclusion
02	At 600 baud rates, after a long-time long afterglow test of oscilloscope, the interval between framer is designed to be 60ms, which meets the requirement of Modbus protocol greater than 58.334ms	ОК

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Test case number	Test result	Test conclusion
03	At 1200 baud rate, after a long time long afterglow test of oscilloscope, the interval between framer is designed to be 29.6ms, which meets the requirement of Modbus protocol greater than 29.167ms	OK

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Tek n	Trigʻd	<u>M Pos: 49.20ms</u>	光标
2		en operation overligens to out overligen glover mode	类型 时间
			信源 CH1
			∆14.8ms ∆67.56Hz ∆V 80.0mV
			光标 1 33.20ms -1.12V
2 最大值 240m ¹ 1 最大值 3.84V 1 峰-峰值 5.36V	/ 2 频率 2 峰-峰值 1 最小值	625.0Hz? 400mV -1.52V	光标 2 48.00ms -1.04V
(1 2.00V (2 2.00V))[M 5.00ms		<10Hz
请等待 Test case number	Test result	Test conclusion	<u>Ħ12H 15:19</u>)
04	At 2400 baud rate, after a long-time long afterglow test of oscilloscope, the interval between framer is designed to be 14.8ms, which meets the requirement of Modbus protocol greater than 14.584ms	OK	

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Tek n	Tria'd	M Pos: 22.70ms	光标
			类型 时间
			信源 CH1
			∆7.40ms ∆135.1Hz ∆V 0.00V
			光标 1 16.60ms -320mV
2 最大值 320mV 1 最大值 4.72V 1 峰-峰值 5.36V	/ 2 频率 2 峰-峰值 1 最小值	? 480mV -640mV	光标 2 24.00ms -320mV
2.00V 2.00V 1 2.00V 2 2.00V)(M 2.50ms		<mark><10Hz</mark> 月12日 15:17
Test case number	Test result	Test conclusior	
05	At 4800 baud rates, after a long-time long afterglow test of oscilloscope, the interval between framer is designed to be 7.4ms, which meets the requirement of Modbus protocol greater than 7.294ms	ОК	

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	<u>M Pos: 10.72ms</u>	光标
		类型 时间
		信源 CH1
		△3.76ms △265.9Hz △V 4.96V
		光标 1 8.280ms 4.72V
✓ 2 频率 2 峰-峰值 1 最小值	19.23kHz? 400mV -400mV	光标 2 12.04ms -240mV
M 1.00ms		<mark><10Hz</mark> 月12日 15:15)
Test result		
At 9600 baud rates, after a long-time after glow test of oscilloscope, the interval between framer is 3.76ms, which meets the requirement of Modbus protocol greater than	ОК	
	 2 频率 2 频率 2 峰峰值 1 最小值 M 1.00ms Test result At 9600 baud rates, after a long-time after glow test of oscilloscope, the interval between framer is 3.76ms, which meets the requirement of Modbus	2 频率 19.23kHz? 400mV 2 峰峰值 400mV 400mV M 1.00ms CH1 / 3.36V 022年10 Test result Test result At 9600 baud rates, after a long-time after glow test of oscilloscope, the interval between framer is 3.76ms, which meets the requirement of Modbus protocol greater than

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Tek _n_	Tria'd	<u>M Pos: 5.340ms</u>	光标
2		a nimi kula provansko plan pravni su odočenstvani	类型 时间
			信源 CH1
			∆1.88ms ∆531.9Hz ∆V 160mV
			光标 1 4.160ms -80.0mV
2 最大值 240m ¹ 1 最大值 4.96V 1 峰-峰值 5.28V	2 峰-峰值	15.62kHz? 400mV -320mV	光标 2 6.040ms -240mV
2.00V2_2.00V 【请等待…)(M 500us		<mark><10Hz</mark> 月12日 15:40)
Test case number	Test result	Test conclusior	1
07	At 19200 baud rates after long time afterglow test of oscilloscope, the interval between framer design is 1.88ms to meet the Modbus	ОК	
	protocol requirements greater than 1.823ms		

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Tek	Tria'd	<u>M Pos: 2.660ms</u>	光标
5 magni antingingi pinatang interferenci pin	ini ya nija na ini ya ini ya ini ya ni ya ni ya ni ya ni na ina ini ya ini ya na ini ya ini ya na ini ya ini ya	legidelegiste enternisien en manglegen mode	类型 时间
			信源 CH1
	· · · · · · · · · · · · · · · · · · ·		∆960us ∆1.042kHz ∆V 0.00V
1 Hill Will I G Light Hild hud establish			光标 1 2.070ms -80.0mV
2)最大值 320m/ 1)最大值 4.96V 1)峰-峰值 5.28V	2 峰-峰值	222.2kHz? 400mV -320mV	光标 2 3.030ms -80.0mV
1 2.00V 2 2.00V)[M 250us		<10Hz
(请等待…	I.	022年10	月12日 15:44)
Test case number	Test result	Test conclusior	1
08	At 38400 baud rates is tested by oscilloscope for a long time and long	ОК	
	afterglow, the interval		
	between the designed		
	framer is 0.96ms to meet		
	the requirements of		
	Modbus protocol greater		
	than 0.912ms		

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Te <u>k</u> n_	Tria'd	<u>M Pos: 1.832ms</u>	光标
2) 11.000,000,000,000,000,000,000,000,000,0	ndensionalis program de la forma de la compañía de	den janga den serie sinder an serie se	类型 时间
	· · · · · · · · · · · · · · · · · · ·		信源 CH1
			∆620us ∆1.613kHz ∆V 80.0mV
			光标 1 1.392ms -80.0mV
 2 最大值 320m√ 1 最大值 5.04V 1 峰-峰值 5.36V 	/2 频率 2 峰-峰值 1 最小值	? 480mV -320mV	光标 2 2.012ms 0.00V
2.00V 2.00V 1 2.00V 2 2.00V)(M 100us		< <mark>10Hz</mark> 月12日 15:46
Test case number	Test result	Test conclusior	
09	At 57600 baud rates, after a long-time long afterglow test of oscilloscope, the interval between framer is 0.62ms, which meets the requirements of Modbus protocol greater than 0.608ms	OK	

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Te <u>k</u>	Triq'd	M Pos: 882.0us	光标
		eter se en	类型 时间
			信源 CH1
			∆328us ∆3.049kHz ∆V 0.00V
1 - Humanishi Wilaying a Kilakin kating sa			光标 1 696.0us 0.00V
2 最大值 320m 1 最大值 5.20\ 1 峰-峰值 5.44\	2 峰-峰值	? 560mV -240mV	光标 2 1.024ms 0.00V
(<u>1</u> 2.00V (2) 2.00V)[M 100us		<10Hz
〔请等待…		022年10	月12日 15:49)
Test case number	Test result	Test conclusior	ı
10	At 115200 baud rates is tested by oscilloscope for a	ОК	
	long time and long		
	afterglow. The interval		
	between the designed framer is 0.328ms, which		
	meets the requirements of Modbus protocol greater		
	than 0.304ms		



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